



Vladimir Ilyich Lenin, founder of the Soviet State

NIKOLAI MIKHAILOV

GLIMPSSES OF THE

ITS ECONOMY
AND
GEOGRAPHY



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TRANSLATED FROM THE RUSSIAN BY
RALPH PARKER AND VALENTINA SCOTT

DESIGNED BY Y KRASNY

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NATURAL RESOURCES

TERRITORY

The Soviet Union stretches from west to east in a gigantic broken ellipse. On the west its territory begins at the Polish frontier near Kaliningrad, on a long sandy spit running out of the southern shore of the Baltic. The eastern extremity of the Soviet territory lies at Cape Dezhnev on the Chukotsky Peninsula. That is the farthest point east on land but one would have to go still farther east, into the Bering Strait, which divides America and Asia, to find the most easterly point of the U.S.S.R., the Ratmanov Island. The Soviet Union stretches through more than 171 degrees of longitude, almost the entire breadth of the eastern hemisphere.

The extremities of the Soviet Union lie so far apart that it is day at one end of the land when it is night at the other. There is an eleven-hour difference in time between the two extremities. When it is 5 a.m. at Cape Dezhnev, it is still only midnight at Lake Baikal in Siberia and 7 p.m. of the previous evening in Moscow.

The southernmost point of the Soviet Union lies on the borders of Afghanistan in Turkmenia, near the town of Kushka. From there it is only 12 degrees of latitude to the tropics. But the most northern point of the land mass lies well inside the Arctic Circle at Cape Chelyuskin in Siberia. From there it is only 12 degrees to the North Pole. And if you were to go to the northern tip of Rudolf Island in the Franz Josef Land Archipelago, in the Arctic Ocean, you would be only eight degrees from the North Pole.

Turkmenia and northern Siberia are almost 5,000 kilometres* apart. Compare the nature of these parts of the country and you would realize the great breadth of it. Under the hot sun of subtropical Turkmenia the tree of Arabia—the date-palm—bears fruit—the tree which, the Arabs say, likes “to have its head on fire.” But at Cape Chelyuskin the stern sea wind often carries ice-floes to the coast even in summer and piles up hummocks of ice on the shore

It is not only the frontier between night and day that has so far to run from meridian to meridian across the Soviet Union. The seasons too take a long time to move across the parallels

Spring comes to southern Turkmenia quite early, in the first weeks of January. There the winter is short. Indeed, it can hardly be called winter at all. Very short spells of frost alternate with warm autumn or spring days. The mean January temperature is above 0°C. Should snow fall it melts at once. Ploughing and sowing begin early in the new year.

By February, spring is already on the way out. The nights are still cool but during the day the earth is hot under the bright sun

Leaving the southern borders the spring begins to move northwards. In March-April, it reigns over the Central Asian desert of Kara-Kum. The desert is unlike its usual self: the air is humid, the sun does not burn, it warms. The yellowish-brown earth is carpeted with red tulips and poppies, with purple heliotrope. But by the end of April the sun is burning hot.

* 1 metre=3.28 feet
1 sq. metre=10.7 sq. feet
 =1.19 sq. yards
1 cubic metre=35.3 cu. feet
1 centimetre=0.396 inch
1 kilometre=0.62 mile
1 sq. kilometre=0.386 sq. mile
1 cubic kilometre=0.24 cu. mile
1 hectare=2.47 acres
1 centner=3.49 bushels
1 pood=16 kg
1 kilogramme=2.2 lbs.

In May, the lands farther north, the steppes of the middle belt of the U.S.S.R., are a mass of flowers. The snow melts and reveals the moist ploughed chernozem (black earth).

The winter retreats farther north, into the forest zone. The steppes may be already threatened with drought but there the humid warm season of flowering is only just arriving. Apple-trees blossom in Moscow in late May, almost two months later than in Turkmenia. That will give you an idea of the pace at which the spring moves.

In the far north of Siberia the spring comes really late—in June. The tundra rivers open, flowers bloom. But frost may strike any day. At last, though, the spring reaches the shores of the Arctic Ocean and, passing rapidly through a brief summer into autumn, prepares as early as August to set off on its long journey southward.

The Soviet Union has an area of 22,400,000 square kilometres, two and a half times more than the United States. There is room for 700 countries the size of Belgium within the borders of the U.S.S.R.

A better idea of the size of the U.S.S.R. can be obtained by comparing it with whole continents rather than with countries. It is a little smaller than Africa, bigger than South America, and three times the size of Australia.

The Soviet Union stretches right across Eurasia, the world's largest land mass. Thus the Soviet Union is a state which lies in both halves of the world at once: it is the biggest state in Europe and the biggest in Asia, too.

Great spaces, we know, create difficulties for the economic development of countries. They require the building of a ramified, and hence expensive, transport system.

But extensiveness of territory also has great advantages. After all, the greater the area of a country, the greater, as a rule, its natural resources. In a small country something is always missing: there is too little coal or no oil, or insufficient timber and so on. But in a big country there are greater possibilities of finding the necessary resources, it is easier, other conditions being equal, to make oneself economically independent, easier, too, to achieve abundance of material wealth.

The Soviet Union is not only very large, it is also very varied in its natural conditions, and that is highly important

For example, the belt of fertile chernozem soil extends so far across the Soviet Union—from the Ukraine to Siberia—that it takes in territories with different climatic conditions. Thus a drought or exceptionally rainy weather can harm only a part of the country's wheat granary at a time.

The higher the techniques of production are perfected the more complicated does production become. The most varied natural resources have to be tapped. To build aircraft, for example, we need aluminium, steel, chrome, nickel, copper, tin, niobium, magnesium, zinc, mica, thorium, oil, wood, fabric, rubber, plastics . . . And that is far from all. Modern industries are highly interlinked. Obviously, the more varied the wealth of the country, the easier it is to combine various forms of production.

Ferrous metals industry is the basis of all industry. But to smelt ferrous metal you have to combine coke and iron ore. Within the borders of Soviet Ukraine alone there are iron ore and coal and all the other raw materials required in the ferrous metals industry. Incidentally, the Ukraine is only one-fortieth part of the area of the whole country. It is easy to imagine what great possibilities exist within the frontiers of the vast expanse of the Soviet Union.

Consequently, the extensiveness of the country provides many favourable conditions for the development of Soviet industry and of the national economy as a whole. That positive aspect of an extensive territory continues to grow with the development of Soviet transport.

However, the size of a country and the variety of its natural resources do not solve anything automatically. They can only help economic growth which is brought about not by them—far from it—but by the social regime of the given country. The Soviet Union differs little in its size and physical nature from tsarist Russia. But tsarist Russia was a backward agrarian country while the Soviet Union, as a result of rapid industrial and cultural construction, due to its new social system, has become an advanced industrial land.

The borders of the U.S.S.R. are more than 60,000 kilometres long—one and a half times the length of the Equator. Imagine a train travelling non-stop two thousand kilometres a day around the borders of the Soviet Union. It would take a whole month over the journey. And if one were to walk, covering 25 kilometres a day, one would be hard put to do the trip round the borders in seventy years. The U.S.S.R. has land borders with twelve states—on the west with Norway, Finland, Poland, Hungary, Czechoslovakia, and Rumania, on the south with Turkey, Iran, Afghanistan, China, Mongolia, and Korea.

No other country in the world has such long borders or touches so many other states.

PLAINS AND MOUNTAINS

The billions of years of the earth's existence, the different fates of its separate parts, the periods of comparative calm and others when the earth's crust has been in violent movement, reflected in its relief, have given it disparate features. And it is natural that in a country which covers one-sixth of the territory of the globe, we should find almost all the diverse forms of the earth's surface.

Plains—here undulating like a creased carpet, there as smooth as a table-cloth—stretch for thousands of kilometres. For example, the train that traverses the West-Siberian Lowland from end to end, travels a day and a night, and yet another day, but during all that long time the gradients on that line are almost imperceptible to the eye. On the Omsk-Novosibirsk run you have to travel a quarter of a kilometre to rise a single centimetre.

The mountain ranges stretch one behind another. In some places they are confused in intricate uplands and knotted in great mountain massifs. Some of the mountains of the Soviet Union are relative newcomers on the earth, such as the Caucasian Mountains which are steep and sharp-edged; others, though, are very ancient, such as the

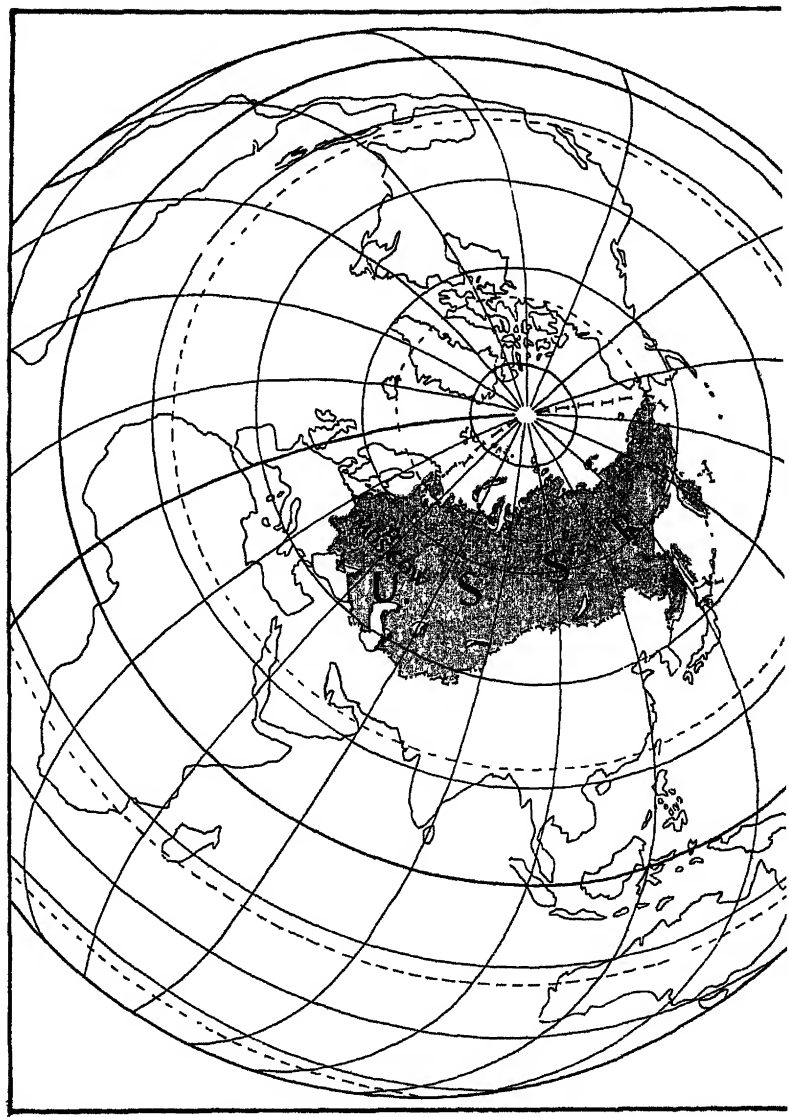
Urals which have been worn smooth during hundreds of millions of years. Some mountains are quite low, forest-clad to their summits, such as the mountains of the Far East, but there are others—the Tien Shans in Central Asia, for example—whose crests are crowned with snow and gleaming perpetual ice, and there the trees grow only on the slopes.

The surface of the U.S.S.R. can be conventionally broken into two almost equal parts, divided by the Siberian river Yenisei. West of the Yenisei, with the exception of the extreme south, the country mainly consists of plains and depressions, east of the Yenisei it is almost entirely mountainous

In the middle of the western, flat part of the U.S.S.R. lies its “stone belt”—the Ural Range, running from north to south for over 2,000 kilometres. To the west of the Urals stretches the Great Russian (East-European) Plain, rising to small elevations in places. This, as a whole, is the most densely populated and most exploited part of the country. East of the Urals is located the West-Siberian Lowland. It is populated and exploited mainly in its southern, un-forested parts.

Along the south of the flat expanses of the western part of the Soviet Union run, more or less high mountains in a chain stretching from west to east—the Carpathian, Crimean, Caucasian, Kopet-Dag, Pamir, Tien-Shan, and Altai ranges. Of these the highest are the Pamirs, which rise to the highest peak in the Soviet Union—Mount Stalin (7,495 metres above sea level). Not far from this peak is the world's biggest non-Arctic glacier—the Fedchenko Glacier. This enormous stream of ice—some 80 kilometres long—crawls slowly through the mountains.

The valleys in the eastern Pamirs are located at an altitude of four kilometres. At such a height the rarefied nature of the atmosphere makes itself felt very strongly: you cannot walk without panting. At night in the Pamirs water often freezes even in summer, but during the day the sun burns mercilessly. That too is connected with the rarefied atmosphere.



nels, hanging over abysses. On the other hand the mountains provide the right conditions for animal husbandry. On the mountain slopes of the Caucasus, the Tien Shans, and the Pamirs there is such a combination of moisture and warmth that we find there the best grazing-grounds for livestock—lush grass grows in the mountains all summer. In these regions stock-raising on mountain pastures is highly developed.

The mining industry, supplying mineral raw materials, can, of course, exist in the plains but nevertheless minerals are more easily found in places where the earth's crust is broken and the strata brought to the surface. Thus mountains are valuable in the Soviet economy because in many parts of them lie ores, and their mineral wealth has been laid bare as, for example, in the Urals.

In remote, mountainous regions of Russia, which were difficult of access, there used to be many unprospected places, indicated on the maps as "white spots." Now none of the "white spots" remain. Soviet scientists have explored these regions. For example, expeditions working in north-east Siberia discovered the Chersky Range which is almost as long and covers practically the same area as the Caucasian Range. New mountains have also been found on the bed of the seas lying off the coasts of the U.S.S.R. It was, for instance, recently established that the entire Arctic Ocean was bisected by a high submarine range, now named the Lomonosov Range after the great 18th-century Russian scientist.

Amidst the mountains of Kamchatka were discovered geysers—mighty fountains of boiling water shooting out of the ground. Some of these geysers shower water to a height of fifty metres, while the jets of steam rise to 300 metres.

Mountain climbers have conquered nearly all the highest peaks in the U.S.S.R. and have even descended into the crater of the Klyuchevskaya Volcano.

With enormous difficulty roads have been laid through the steep mountains in many places. A motor road many hundreds of kilometres long has, for instance, been driven through the cloud-capped Pamirs, as a means of strengthening the economic links with the

mountain districts. In places this road has been built where people used to make use of *ovringi*—narrow, log shelves, supported on poles driven into the precipitous cliffs at dizzy heights.

SEAS

The Soviet Union is a great sea power. The Soviet land is washed on three sides by the waters of the World Ocean: the eastern and the northern borders in entirety, the western border for almost half its length. The U.S.S.R.'s sea coast is twice as long as its land borders.

The World Ocean, we know, is divided into four oceans, three of which touch Soviet territory in the form of twelve seas, each unlike the other. The Black Sea does not freeze in winter, but ice-floes are to be seen in the Kara Sea even in summer. The surface waters of the Sea of Azov warm up to a temperature of 30°C in summer, but in the Barents Sea the coastal ice-floes form icebergs. Near Leningrad the difference between high and low tides is less than five centimetres, but in the Penzhina Inlet of the Sea of Okhotsk it is eleven metres.

From the west the Atlantic Ocean, curving between the peninsulas of Europe, reaches up to the Soviet Union with two of its seas—the Black Sea and the Baltic. The Black Sea lies blue in the beams of the southern sun close to the feet of the Crimean and Caucasian mountains. The Baltic creeps beyond low pine-clad sand dunes, grey under the cloudy sky, greenish when the clouds scatter.

From both these seas access to the ocean is difficult. From the Baltic a narrow Öresund Sound, the Great Belt and the Little Belt lead to the ocean; the Black Sea is linked with the Mediterranean by the narrow necks of the Bosphorus and the Dardanelles. Out of the seas and through these straits pours the water from the rivers which are thus continually adding more fresh water to the ocean. This water being lighter keeps to the surface, but below, the heavy salt water of the ocean flows in the opposite direction. As a result of this clash between rivers and the ocean the waters of the Black Sea and the

Baltic are less salty than those of the ocean, especially in their upper levels.

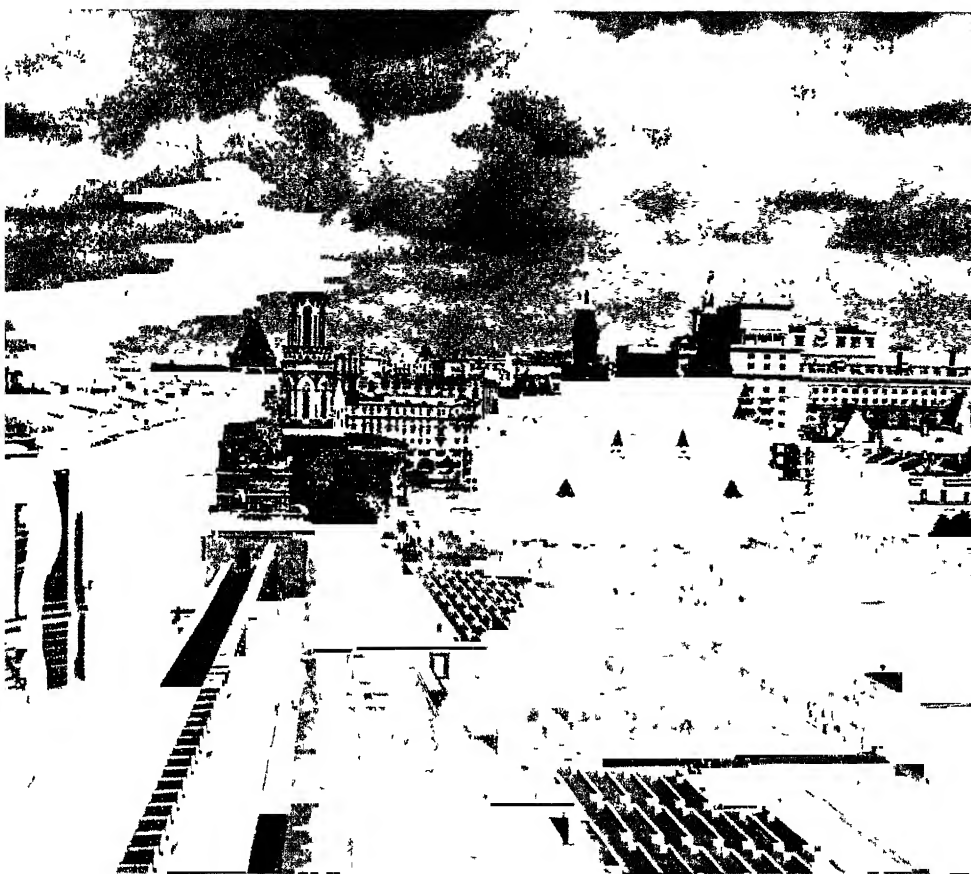
The Baltic Sea is the freshest of the seas adjacent to the U.S.S.R. And the fish which live and are caught in that sea are the sort which like water that is only slightly salty—such as the sprat, both the large and small variety, and the smelt.

In the Black Sea are caught khamsa, grey mullet, mackerel and bullhead. The Black Sea is less freshened than the Baltic and in summer the fishermen net fish that have come to feed there from the salt waters of the Mediterranean.

Within the narrow Kerch Straits lies the Sea of Azov, a gulf of the Black Sea, and a sort of bellmouth to the River Don. This is the smallest sea in the world, less than 40,000 sq. km. in area. Although it is not distinguished for the variety of its fauna and flora, it occupies the first place among all seas in the world for the relative abundance with which they grow there. The main hauls in the Sea of Azov are khamsa, pike perch, and sardelle.

But the seas fed by the Atlantic Ocean do not occupy the first place in the Soviet fishing industry. These seas are mainly important to the Soviet Union for another reason. The Black Sea, the Sea of Azov, and the Baltic extend deeply into the land mass, reaching to the vital areas of the country, washing their shores and bringing with them rich cargoes.

Near the Black Sea and the Sea of Azov lie the Donbas and the Dnieper Basin—the principal coal and metallurgical base of the U.S.S.R. The Caucasus and the fertile southern steppes also gravitate in this direction, and, since the opening of the Volga-Don Canal in 1952, even the Volga Basin. In the ports of Novorossiisk, Batumi and Tuapse tankers take on oil, brought by pipeline or in tank-cars by rail from the Caucasian oilfields. At the port of Poti the manganese ore of Chiatura is loaded into the holds of ships. Novorossiisk exports cement as well as oil. The port of Mariupol on the Sea of Azov is the access to the sea for Donbas anthracite. At Rostov, Khereson and Odessa stand elevators for the wheat of the Kuban and Ukrainian steppes.



Red Square, Moscow



Lenin Peak in the Pamirs, Tajik SSR., one
of the highest in the Soviet Union

Coasting vessels transport these cargoes from port to port and ocean-going ships pick them up and take them on to distant seas, as far, even, as the Antarctic where the Soviet whaling fleet, the *Slava*, sails

If the Black Sea is primarily the sea of the Ukraine, the Kuban and the Caucasus, the Baltic is the sea of the north-western and central regions of the Soviet Union. It provides a direct sea route to Europe, to the Atlantic. On the Baltic is situated a long chain of Soviet ports, the principal ones being Leningrad, Tallinn, Riga, Liepaja, Ventspils, Klaipeda and Kaliningrad. Some of the Baltic ports are ice-free in winter.

The Barents Sea with its gulf—the White Sea, the Kara Sea, the Laptev Sea, the East Siberian Sea and the Chukotsk Sea—are parts of the Arctic Ocean, more than half of whose shores lie in the U.S.S.R. The ocean itself lies beyond clusters of islands around the North Pole. And its outskirts thrust their shallows into the land.

At the height of the brief Arctic summer the edge of ice in the Arctic Ocean retreats from the coast and the ships on the Northern Sea Route, meeting the ice-floes and cleaving through the ice-fields, sail along the Siberian coast. Three months later the whole of this area is ice-bound again, the coat of ice attaining a thickness of two metres in the month of May. Only in the middle of the sea do the gusts of wind and the action of the waves burst it open, causing hummocks of ice to pile up and exposing patches of water whose temperature is nearly two degrees below 0°C.

The Northern Sea Route, which is provided with fuelling bases and with an aerial reconnaissance service and ice-breakers, serves during the summer as a passage for navigation between the European part of the U.S.S.R. and the Far East. Along it cargoes are carried to and from the northern part of Siberia. Previously these places were quite isolated from the rest of the world. Enormous efforts had to be expended in order to establish a regular sea route in the Far North and it requires much work to keep it in operation each year.

Northern Siberia has been greatly developed since the Revolution: new towns and scientific stations have been built there and the way

of life of peoples which were previously dying out has been transformed Northern Siberia has many needs food, a variety of goods, machinery But it has something to offer in return timber, fish and minerals

The great Siberian rivers empty their waters along the Northern Sea Route. They too link this route with the hinterland of northern Siberia And at the estuaries of these rivers ports have been built, where cargoes are transferred from ocean-going ships to river vessels and vice versa

Of all the Arctic seas the Barents Sea is the most important economically for the Soviet Union A branch of the warm current of the Gulf Stream flows into it, so all the southern part of the Barents Sea remains ice-free in the severest of winters

During the frosty Arctic night coils of vapour, lit by the greenish-lilac hues of the Northern Lights, rise from the Kola Bay But the water never freezes Off these coasts the winter is warmer than in Moscow which lies two thousand kilometres farther south

The White Sea lies farther south than the Barents Sea, but no warm water enters it and it is ice-bound for a long season Only with the help of powerful ice-breakers can ships be brought out of Arkhangelsk during the winter Arkhangelsk is the Soviet Union's main timber port But at Murmansk on the Barents Sea the gates to the Atlantic and Arctic oceans are open the year round

Throughout the year fishing trawlers ply the Barents Sea and bring in cod, herring and haddock to Murmansk, one of the main fishery centres of the Soviet Union

In the Far East three seas of the Pacific Ocean enclosed by chains of islands touch the coast of the Soviet Union These are the Bering Sea, the Sea of Okhotsk, and the Japan Sea Near Petropavlovsk-Kamchatsky the Pacific Ocean itself touches the continent and its waves lick the foot of the volcanoes In clear weather the smoking crater of the Klyuchevskaya Volcano can be seen from hundreds of kilometres out to sea.

In the southern waters off the Soviet Union's Far East coast swim tropical fish as brilliant and multicoloured as butterflies. Yet even,

in summer time snow-fields run down to the edge of the water in the north. Near the coasts the Far East seas, cooled by the land mass, freeze over in winter. Near the Shantar'skiye Islands in the Sea of Okhotsk not all the ice-floes melt even in summer. But from the direction of the Pacific Ocean branches of the Kuro Siwo—the Gulf Stream of the Pacific—carry warm water to the shores of the Far East seas all the year round.

The principal Soviet ports on the seas of the Pacific Ocean are Vladivostok and Nakhodka.

The seas of the Pacific Ocean are very large: the Japan Sea is twice as big as the Black Sea, the Sea of Okhotsk four times, the Bering Sea five times as big. The Black Sea is over two kilometres deep, but these seas are twice that depth. In the Sea of Okhotsk and the Bering Sea strange creatures dwelling in the ocean depths are brought to the surface—creatures with telescopic eyes, luminous sides and mouths bristling with teeth.

Life in the Pacific Ocean seas, at the junction of the ocean and continental waters, is highly varied. Some of the fish live and spawn in these waters, such as herring. Others live there but spawn in the rivers—such as the fish of the salmon family. A third variety of fish come there only to feed.

There are whales to be found in the Bering Sea. In the shallows of the Komandorskiye Isles there are many fur seals. On the seabed near the Kamchatka coast crabs are found.

LAKES

Within the borders of the Soviet Union lies the biggest lake in the world, so big that it is known not as a lake but as a sea—the Caspian Sea. As in a sea it is easy to lose sight of land on the Caspian. In area it is more extensive than the Black Sea. Its waters are as rough as those of a sea—you will not cross it without a tossing. It is as deep as a sea—almost a kilometre. And it is as rich as a sea, being one of the main sources of fish in the Soviet Union. There are many

varieties of fish in its waters—Caspian roach, herring, perch pike, sturgeon, etc

Caspian shipping does not lag behind that of other seas in the Soviet Union, although the northern part freezes for a long period of time, which is a considerable handicap. Timber is carried southwards, cotton and oil to the north. The Caspian Sea occupies first place among Soviet seas for freightage. Oil is carried in capacious tankers from Baku and Makhachkala to Astrakhan from where it is taken along the Volga into the heart of the country.

There is a very interesting gulf in the Caspian called Kara-Bogaz-Gol. Though it is extensive its waters are shallow and under the hot sun this water evaporates as if it was in a cauldron. A heavy solution containing various salts is formed, the most important of them being Glauber salt. In the winter it occurs in crystalline form. Storms bring it to the coast where, in dehydrated state, it lies in white heaps of mirabilite. This substance, which is used in the production of sulphuric acid, soda and glass, is collected in special fields which have been constructed on the shores of the Kara-Bogaz-Gol during Soviet times.

Not very long ago, sea water used to flow through the narrow straits that link the Caspian with the Gulf of Kara-Bogaz-Gol, thus replacing the water that had evaporated. Because of this, at first sight puzzling, flow of water into the closed gulf the local inhabitants—Turkmenians—called it Kara-Bogaz, i.e., "black mouthed."

But in recent years the level of the Caspian has fallen considerably. Water no longer flows into the gulf as regularly as before. The pattern of the formation of salt in the gulf has changed. This has entailed pumping water out of the Caspian into special reservoirs.

In addition to the Caspian, there are many other lakes in the belt of desert and semi-desert land in the south of the Soviet Union. Several of these contain rich deposits of valuable salts. Around the bluish waters of the lakes, lined with dense growth of reeds, stretch parched brownish-yellow plains. Among the largest of the lakes in this belt are the Aral Sea and Lake Balkhash.



A forest shelter belt near Stalingrad



A gorge in the mountains of Northern Caucasus

The north-western part of the U S S R is also rich in lakes. Here they are often linked by rapids which provide suitable conditions for the construction of hydroelectric power stations. The largest of these are Lake Ladoga, Lake Onega, Lake Chudskoye (Peipus) and Lake Ilmen. Many of the lakes in the north-west are of glacial origin.

In the mountainous regions of the U S S R, where the flow of the rivers is hindered by their rocky beds or by the formation of hollows, mountain lakes are to be found. Lake Baikal is a particularly interesting example of a mountain lake. It is the deepest lake in the world (1,741 metres). The waters of Lake Baikal are cold and of crystalline purity. Though many times smaller in area than the Baltic, Lake Baikal exceeds it in the volume of water it contains. Lake Baikal lies among high wooded mountains; the railway line that skirts the lake on the south passes through 39 tunnels.

The largest of the other mountain lakes are Issyk-Kul in Kirghizia and Lake Sevan in Armenia.

The mountain lakes harbour great reserves of "white coal." They are like peculiar water-towers.

Lake Sevan lies high up in the mountains, an enormous bowl, brimful with water. From this lake the River Razdan flows and, hurtling down through a gorge, runs 100 kilometres to the south to join the River Arax, gradually dropping one kilometre.

At the present time steps are being taken to utilize a part of the water reserves of Lake Sevan. A chain of power stations is being built on the River Razdan. The flow of the river is being strengthened by drawing off artificially a part of the water from the lake—a special tunnel is being bored for the purpose. The waters of Lake Sevan are feeding power stations and irrigating the cotton fields and vineyards of Armenia.

There is a peculiar lake in the Pamirs called Lake Sarez. Formed after a landslide in the gorge of the Murghab River as recently as 1911, it quickly accumulated water and is now over 80 kilometres long and up to half a kilometre in depth.

In recent years big new reservoirs have been formed in the Soviet Union. They have appeared as the result of building large power

stations and canals, which has entailed damming rivers. The geographical map has seen the following additions: the reservoir on the White Sea-Baltic Canal in Karelia in the north, the Moscow Sea, the Rybinsk Sea and the Kuibyshev Sea on the Volga, the Tsimlyanskoye Sea on the Don, the Mingecheaur Sea on the River Kura in Transcaucasia, etc. These artificial lakes are very large: for example, the Rybinsk Sea on the Volga is nearly five times the size of Lake Geneva.

RIVERS

Every year in the form of rain and snow about 9,000 cubic kilometres of water fall on the territory of the U.S.S.R. This is the equivalent of a cube with sides twenty kilometres long. From the sky fall 35 rivers equal to the Volga's flow throughout the year. Fifty-four per cent of the water that falls evaporates, the remaining 46 per cent flows away. That 46 per cent of all the rain and snow forms the flow of the rivers of the Soviet Union.

The rivers are very different. Some of them, like the Ob, cross flat ground and flow calmly, others, like the Angara or the Katun, seethe in rapids. The Volga overflows its banks in the spring, when the snow melts in the fields, while the Amur, in the virtually snow-free Far East, floods in summer on account of the heavy monsoon rains. The Kolyma in the north is covered with ice during eight months of the year while the Rion in warm Georgia never freezes at all.

The principal rivers of the European part of the U.S.S.R. rise in the middle of the Great Russian Plain and flow towards the sea. The Dnieper flows into the Black Sea, the Don into the Sea of Azov, the Western Dvina (the Daugava) into the Baltic, the Northern Dvina into the White Sea, the Pechora into the Barents Sea. The greatest of all Europe's rivers, the Volga, empties its waters into the Caspian. The Volga is 3,700 kilometres long, and is the main water route in the U.S.S.R. On it and its tributaries are carried about half of all the cargoes transported by river in the country.

The chief rivers of Siberia flow from south to north—primarily, the Ob, with its tributary, the Irtysh, the Yenisei with the Angara and the Lena. The Yenisei, measured from its source the Selenga is the longest river in the Soviet Union—5,940 kilometres long.

In the Far East the Amur flows into the Pacific Ocean.

The rivers of Central Asia do not reach the open sea. Two of the largest rivers of Central Asia—the Amu-Darya and the Syr-Darya—flow into the enclosed Aral Sea.

The length of the Soviet Union's navigable rivers is almost equivalent to the length of its railway lines.

The rivers of the U.S.S.R. contain enormous reserves of electricity. The total potential of the big rivers alone amounts to 300 million kilowatts.

CLIMATE

The climate of the Soviet Union is extremely varied. There are places in Siberia where the winter is colder than at the North Pole, while on the plains of Central Asia the summer is hotter than on the Equator. In Yakutia the mercury in winter may fall to -70°C , when the vapour of human breath freezes and crackles in the air. But in Turkmenia the summer temperature of the baking sands of the desert reaches $+70^{\circ}\text{C}$ —and one can burn oneself by touching the ground.

In Uzbekistan the barley is already being harvested when in Petropavlovsk Kamchatsky snow is still falling. On the shores of the Bering Sea it takes a larch a century to grow a little thicker than a ski-stick, while in subtropical Ajaria a young bamboo shoots up more than a metre in a single day.

At one and the same time of the year we could be either in the darkness of the frosty Arctic night or beside the sunny never freezing sea under the protection of evergreen palms. We could wander for weeks in one of those dense moist fogs, saturated with minute drops of water, which often occur on the seas near the Pacific Ocean coast, or languish of thirst in the deserts of Central Asia, where for months not a cloud appears in the sky.

But with all this variety the climate of the Soviet Union may be described as temperate and continental, i.e., with great fluctuations of temperature from winter to summer. With a few exceptions the winter is everywhere frosty and is followed by a hot summer.

The variation between winter and summer temperature increases as one moves from the Atlantic Ocean into the heart of the country, i.e., from west to east. Large water masses, we know, make the climate milder: in winter they cause the temperature to rise, in summer they cause it to drop and thus make the climate cooler. The Atlantic Ocean serves the U.S.S.R. as a reservoir of this sort, and moderates the climate.

If in Leningrad, which lies relatively close to the Atlantic Ocean, the winter is fairly mild and the summer not very hot, in Siberia, far from the Atlantic Ocean, there are severe frosts in winter and such heat in summer that cereals, vegetables and apples ripen well.

The Arctic exercises a powerful influence on the climate of the Soviet Union. The masses of Arctic air, encountering no obstacles on their path, penetrate seasonally fairly far to the south and bring cold with them. The study of the Arctic climate is important for the Soviet Union. In this connection a big role is performed by the Soviet Arctic stations, both stationary and drifting.

The coldest part of the country is, of course, the Far North. The climate of the northern coast of the U.S.S.R. cannot therefore be classified as temperate, but as cold.

In the south of the country some places shielded from the north by mountains (the Caucasian coast, the southern coast of the Crimea, and several southern valleys in Central Asia) have a subtropical climate. These parts almost never know a frosty winter. The first spring flowers appear immediately after the last of the autumn ones have faded. Sometimes violets are in bloom on New Year's Day. Sometimes white snow-flakes cover the blue flowers, but only for a short time.

Thus, in the Far North of the U.S.S.R. the climate is cold, in a few separate corners in the south it is subtropical, while in the main part of the country it is temperate.

One of the reservoirs formed in the Volga valley by the building of a power station





The Moskva River near Borodino, not far from Moscow. Typical Central Russian scenery





The Lena River, Siberia

It should be noted that such terms as "cold" and "temperate" are relative. Compared to Western Europe and the United States the climate of the U S S R is severe. This fact adds to the difficulties of agriculture and building. However, the skill of the population and the use of advanced techniques enable these difficulties to be surmounted.

The rainfall in the U S S R is unevenly distributed. The western, European part of the land, nearer to the Atlantic Ocean, is rather humid and rain falls frequently.

As one goes east and south-east, into the heart of the country, precipitation decreases. The moisture from the ocean reaches these parts to a diminishing extent. The south-eastern districts of the European part of the Soviet Union, Kazakhstan and Central Asia are subject to drought. In those parts the sky is usually clear and rain falls rarely.

The continental nature of the climate has its advantages and its disadvantages. In the country's economic life every effort is made to use the advantageous features and to eliminate the disadvantageous ones. In most parts of the land the winter is cold—hence the small-grained, strong and flexible wood, Soviet coniferous timber is known on the world market for its high quality. To protect themselves from the sharp frosts the fur-bearing animals grow warm furs, Siberian furs are the best in the world.

In many parts of the Soviet Union the summer is hot and dry, and this means that excellent grain, rich in albumen, ripens there. Heat and dryness quickly transform the starch in plants into sugar, which is why the grapes and melons of Soviet Central Asia are so sweet. The cotton fibre of these parts is outstanding for its fineness and strength. In several southern regions there is insufficient rainfall and there much effort has to be expended to combat drought and irrigate the crops. In return, man, having received water and the possibility of distributing it as he wishes, at once becomes the master of the land.

Roughly one half of the territory of the U S S R,—in the north and east—is taken up by the zone of eternal frost. there only the surface

of the soil thaws in summer. Eternal frost does not prevent cultivation but presents difficulties to builders. In the U S S R special methods have been devised for building in the regions of eternal frost.

NATURAL ZONES

The Soviet Union, exclusive of its islands, extends from north to south through 42 degrees of latitude. At different latitudes there are variations in the strength of the sun, in the soil, and in all natural life. The natural zones of the U S S R proceed one after another from north to south in gradual transition.

In the Far North we find the *tundra*. Treeless, it stretches under the grey skies along the Arctic seas for thousands of kilometres from end to end of the country. In the peaty, water-bogged soil lichens, mosses and berries grow. Geese cackle and countless flocks of duck quack on the lakes, snipe cry and swarms of mosquitoes hum persistently.

The short summer soon passes and for nine months a thin but dense layer of snow clothes the tundra, blizzards whirl in the Arctic night, the fires of the Northern Lights flare in the sky, and a 40°C. frost strikes. The birds migrate to warmer climes, leaving only the willow ptarmigan and the Arctic owl. The fox changes his coat from brown to white. People bundle themselves in furs from top to toe.

Reindeer-breeding is the customary occupation of the local inhabitants of the tundra. The northern reindeer is used as a draught animal. It provides man with meat and skins.

In tsarist Russia the Far North was a wilderness. No agriculture was practised there. Many of the nationalities of the North—nomadic hunters and fishermen—were becoming extinct.

In Soviet times scientific stations, ports, mines, factories and towns have been established in the Arctic. The population has grown. The task was undertaken to create in the Far North its own agriculture. Experimental agricultural stations were organized. The experiments carried out in severe natural conditions showed that cultivation is possible in the Far North, though it requires much work.

At these experimental stations early-ripening, cold-resisting vegetables were bred. Today in many parts of the Soviet Arctic potatoes, carrots, turnips, radishes and fodder grasses are grown

Farther south, near the Arctic Circle, the tundra gradually makes way for *forest*

A broad forest belt runs right across the Soviet Union from the Baltic to Kamchatka. The forested area of the U S S R is very great, containing over one-third of the forests of the entire world. Particularly renowned are the Olonets mast pines, the firs of Vologda, the splendid Far Eastern pines (known as "Korean cedar"), the excellent Chuvash oaks, the shielded birch with its beautiful wood, and the larches which are irreplaceable in underwater construction.

The northern part of the forest belt is covered almost entirely with coniferous forests (the taiga), the southern part, which is smaller, has mixed growth where deciduous trees—oak, lime, maple, etc.—are to be found among the conifers. There are also many birch-trees in the mixed forests. The birch grows in the taiga too.

The southern border of the forest belt passes roughly through Kiev-Ryazan-Kazan-Tyumen-Tomsk. To the east of Tomsk the forest occupies almost the whole territory down to the southern frontier. The capital of the Soviet Union—Moscow—lies in the south of the forest zone.

The forest podzols are suitable for cultivation but give good yields only when carefully worked and fertilized. But the forest belt has one advantage over the more southern regions: here drought is virtually unknown and the harvests are stable.

In the western, more exploited, part of the country the forests alternate with extensive fields where flax, wheat, rye, oats, potatoes and maize are raised.

There are frequent meadows to be found in the forest belt, especially along the rivers. They serve as a basis for stock-raising, primarily for milk production.

There are also many marshes the draining of which entails heavy expense. In many places, mainly in Byelorussia, much reclamation has been done.

In the forest are found brown bear, wolves, foxes, hares, squirrels, elks and other animals

The eastern, Siberian part of the forest belt is the main region for fur-trapping. The Siberian taiga offers the ash-grey, glossy fur of the squirrel, the dark-yellow silky fur of the sable, the flaming red and pale silver of the fox.

There is a stretch of remarkable mixed forest in the southern part of the Far East, the so-called Ussuri taiga where north and south combine in a unique manner. Vines embrace the trunks of fur-trees, the cranberry grows next to the lotus, the tiger meets the sable.

A great many tree varieties are found in the Ussuri taiga, where elm, hornbeam, oak, ash, maple, Manchurian nut-tree, white Amur lilac, Amur lime, silver, yellow and black birch, Manchurian apple, Ussuri pear and red yew grow in an impenetrable thicket. The feet of the trees are concealed by dense undergrowth. Here there is a multitude of rare plants: the velvet-tree with cork bark and lovely wood, and the Schmidt birch of exceptional strength.

High above the deciduous leaf-bearing trees rise the "Korean cedars", among them you find giants the height of ten-storey houses. One such tree can yield a centner of nuts. Around the trees creepers twine.

In the western half of the Soviet Union, the forests gradually give way to the *steppe*, the farther south you go. Between the forest belt and the steppe belt lies the transitional belt of *wooded steppe*, where the woods grow in islands amidst the open fields. This belt runs southward to the line of the towns Kharkov-Saratov-Barnaul. In the European part of the U.S.S.R. such woods consist mainly of oak, in Siberia of birch.

The steppe belt runs from west to east in a continuous band from the Carpathians to the Altai and further in separated sectors up to Trans-Baikal region. In the south of the European part of the U.S.S.R. the steppes run to the Black Sea.

In the steppe belt, as in the belt of wooded steppe, is found the fertile black soil known as chernozem. The chernozem belt runs con-



A Nenets with reindeer team in the Arctic tundra

The most useful domestic animal in those regions is the camel. It can travel a long time without water. It feeds on dry and thorny vegetation.

The vegetation of the desert adapts itself to an abundance of heat and an insufficiency of moisture. The grasses and shrubs put out very long roots in the desert soil. This enables them to draw water from the depth of the soil. The extensive grazing-grounds of the deserts, still far from fully exploited, are capable of feeding many cattle.

The grey soil of the desert—serozem—becomes fertile with irrigation. Canals, running from the rivers, change parts of the deserts into flowering oases. Oases with their orchards and arable fields lie mainly along the southern fringe of the desert, where the rivers flow down from the mountains of Central Asia.

In the oases of Central Asia the sky is cloudless, the air dry and the sunshine abundant. Here the mulberry-tree comes to its full stature in a matter of three or four years. The grapes and other fruit raised in these places are rich in sugar content. Under certain conditions of crop rotation two harvests a year can be obtained from one field. Cotton is the main crop in these oases.

For a long time irrigation in Central Asia remained as primitive as it had been a thousand years before. But with the establishment of Soviet power, when the land and water were nationalized, large irrigation systems were built. The largest of these at present is the Kara-Kum Canal which irrigates and waters a big part of Turkmenia. The first of its three stretches has been built.

In the extreme south of the U S S R dispersed places with a subtropical climate are found. The main feature of subtropical nature is the almost complete absence of winter frost.

The subtropical parts of the U S S R are divided into moist and dry regions.

In Transcaucasia—on the Black Sea and a part of the Caspian coast—lie the *wet subtropics*. Here we find the warmest winter conditions in the Soviet Union and hot rainy summers. The plants flower all winter. In December the violet and veronica bloom, in January

the walnut, at the end of February the apricot, in early March the almond. It takes but a few years for a wood of trees six metres high to grow up on a patch of derelict land, and the only evidence that here was recently a field is the remains of dry maize stalks in the woods.

In tsarist Russia, tens of millions of gold rubles were spent on importing tea, oranges, lemons, tangerines and essential oils for perfumes.

In the Soviet Union the reclamation of marsh land and the terracing of slopes has enabled large-scale subtropical cultivation to be carried on. In the subtropics not only tea, citrus fruits and plants yielding essential oils are grown, but also the tung-tree which gives a valuable industrial oil, cork oak, and bamboo.

In the estuary of the River Kura in Azerbaijan, and also in some of the valleys in south Tajikistan and Turkmenia the climate is dry and hot. The winters are almost frost-free, the summers almost without rainfall. These are the *dry subtropics*. Here the fields have to be irrigated artificially. In addition to cotton, figs, almonds, rubber-trees, olives and citrus trees are raised.

In parts of the country, mainly in the south and east, lie disconnected mountainous regions. Here the vegetation varies according to the elevation. On the mountain slopes the steppes give way to woods, above which lie splendid grazing-grounds—the Alpine pastures.

MINERAL WEALTH

Tsarist Russia had only a poor knowledge of her riches. Geological surveys left nine-tenths of the country untouched. Russia's share of the prospected world resources of coal was only a little over 3 per cent, of iron-ore resources 1 per cent, of phosphorite resources 1 per cent. Deposits of nickel, potassium, boron, sulphur and bauxite were not known at all.

Industry was poorly developed and quite often Russia imported from abroad what she could have exported herself, such as coal,

potassium and phosphates for fertilizers, graphite for pencils. Even paving stones were sometimes imported. For example, the pavement outside the Bolshoi Theatre in Moscow was paved with stone bought in Sweden.

The rapid growth of industry in the U S S R, the general rise in the cultural level of the Soviet people, the nationalization of the mineral wealth—all this led to extensive geological prospecting and to a radical change of conception about the country's deposits of raw materials. It was proved that the Soviet Union possessed gigantic mineral resources.

No country in the world has such a varied geological structure. The ancient thickness of the Russian and Siberian platforms, the exposed mineral wealth of the Urals and Kazakhstan, the great chain of mountains running from the Carpathians through the Crimea, the Caucasus and Central Asia into Siberia, contain among their ores minerals of the most varied structure and age. The mighty forces of nature have not only scattered mountain ranges and uplands, high plateaus and flat plains over the face of the land, they have also filled them with valuable minerals.

In the Soviet Union's mineral wealth we find all the minerals that exist in the crust of the earth.

One of the most important of these is coal. Coal, we know, is useful not only as fuel. From coal is produced coke for metal smelting. Coal is also a raw material for the chemical industry.

At the present time the geological reserves of coal deposits in the U S S R. make up 57 per cent of the world's total coal reserves. There is much coal in the European part of the Soviet Union, but the richest deposits are in Siberia.

Another important mineral fuel is oil which gives light and heat, moves ships across the sea and serves as a source of raw materials for various chemical products. In its oil deposits the U S S R occupies one of the leading places in the world.

Until recently, the most important oilfield in the U S S R was at Baku in Azerbaijan. However, new oil-bearing regions have been prospected in Soviet times. They form a long chain covering a wide

Sand desert in Central Asia





The Great Fergana Irrigation Canal in Uzbekistan

area between the Volga and the Urals. At present oil has been struck here in over 100 places, of which about 70 are being exploited. They are the principal oilfields of the Soviet Union.

Tsarist Russia did no prospecting for natural gas. Enormous deposits have been found in Soviet times in the Volga Basin, the Ukraine, the Northern Caucasus, Central Asia and elsewhere. The Soviet Union's deposits of natural gas are inexhaustible. They are so great that it is planned to increase the extraction of natural gas thirteen to fifteenfold during the next fifteen years.

The Soviet Union has colossal deposits of peat—60 per cent of the world's deposits. Peat provides the raw material not only for fuel but also for chemicals.

The Soviet Union's mineral wealth includes enormous deposits of various ores.

The principal deposits of iron ores are at Krivoi Rog and Kerch in the Ukraine, at a number of places in the Urals, in Kazakhstan, in the North-West of the European part of the Soviet Union, in Transcaucasia, Western and Eastern Siberia. The iron ores of Krivoi Rog and Kerch feed the factories of the first Ukrainian metallurgical base; the ore of the Urals, Siberia and Kazakhstan goes to the factories of the second, eastern metallurgical base—the Urals-Kuzbas base.

Within the borders of the Soviet Union lies a unique accumulation of iron ore. This is the Kursk Magnetic Anomaly. It is now being exploited. Here the pull on the magnetic needle of a compass is sometimes more powerful than that of the magnetic poles.

The prospected reserves of iron ore in the Soviet Union constitute 41 per cent of world resources.

The Soviet Union has large deposits of manganese ore, especially at Nikopol in the Ukraine and Chiaturi in Georgia. Manganese ore is needed for steel smelting. It has also been found in the eastern parts of the U.S.S.R. The Soviet Union contains 88 per cent of world deposits of manganese.

The Soviet Union holds first place in the copper deposits too. Copper is particularly plentiful in Kazakhstan, the Urals and Armenia.

Without copper—soft, malleable, and highly conductible—modern technology would be inconceivable

The Soviet Union is richer than other lands in lead, zinc, nickel and mercury. There are large deposits of the raw material for aluminium—bauxite—which was unknown in tsarist Russia. Nepheline also serves as a raw material for aluminium; the deposits of this mineral, found on the Kola Peninsula and in several parts of Siberia, are very great.

The Soviet Union has very rich deposits of gold (in Siberia, the Far East, Kazakhstan and the Urals) and of platinum (in the Urals and elsewhere). Not long ago diamonds were found in Yakutia, in the heart of Siberia.

Important deposits of such valuable and rare metals as titanium, wolfram and molybdenum are found in the U.S.S.R.

Let us turn to chemical raw materials. The chemicals industry which began to grow in the Soviet Union after the Revolution and now plays an enormously important role in the life of the country is to a considerable extent based on mineral raw materials. The discovery of apatite in the Kola Peninsula in the Arctic enabled the Soviet Union not only to dispense with the import of raw materials for producing phosphate fertilizers but to start exporting them itself. Besides apatite, phosphorite is needed for the production of fertilizers, and this is found in several parts of the Soviet Union. For example, the recently discovered big deposits of phosphorite in the mountains of Kara-Tau in Southern Kazakhstan are being exploited. There are large deposits of phosphorite in other parts of the Soviet Union. The U.S.S.R. possesses about one-third of the world's resources of phosphate raw materials.

Potassium salts are also required for the fertilizing of the fields. A huge deposit of potassium salts has been discovered near Solikamsk in the northern Urals. The biggest mines in the world are there. The Soviet Union has 54 per cent of the prospected deposits of this raw material.

There are inexhaustible sources of common salt. This is mainly obtained from Lake Baskunchak in the lower reaches of the Volga.



A fur-seal rookery on the Tyuleny Island
in the Sea of Okhotsk, the Far East



A bamboo grove in the Soviet subtropics (Black Sea coast in Georgia)

The Soviet Union is well supplied with various kinds of building materials—lime-stone, granite and marble

The Soviet Union is rich in minerals, but untapped wealth remains to be discovered by Soviet geologists. They are called upon to study open-cast deposits and to prepare them for exploitation; to open up new deposits of raw materials where they are specially useful and easily exploited. The mineral world of the Soviet Union is not only discovered and studied, it is drawn into production and becomes the property of industry.

Thus, the natural wealth of the Soviet Union is great and can furnish the country with all it needs. This, however, has no negative effect at all on the U S S R's economic relations with other countries. The Soviet Union stands for a broader development of trade in raw materials and manufactured goods as well with other states on the principle of mutual benefit. In relations between any countries there are always wares to be bought and sold at mutual benefit. The foreign trade of the Soviet Union is continually growing. In 1946 the U S S R traded with 40 countries, at present it trades with more than 70. The Soviet Union's foreign trade will continue to expand in the future.

After this glance at the physical geography of the U S S R, let us turn to a short review of the separate industries, agriculture and transport of the U S S R, paying attention to their general dynamic quality and to the changes in their geographical distribution.

ECONOMY

THE SOVIET UNION—AN INDUSTRIAL POWER

Tsarist Russia was a backward agrarian country which had comparatively few factories. Technologically it lagged behind other lands. The industrial towns were drowned in a sea of villages. Many enterprises belonged to foreigners.

In 1917 the peoples of Russia rose in the Socialist Revolution. Soviet Russia could not have consolidated its new social system without developing industry. And so, after the Civil War, a programme of industrialization was launched. In 1929 the Soviet people set about fulfilling the First Five-Year Plan.

Old enterprises were rebuilt and equipped with new machinery which, before the establishment of a domestic machine-building industry, had been imported.

New factories were built. Tents were pitched in the steppes, the forests, the mountains, camp-fires blazed. The geologists prospected for coal and ore, scientists and economists planned where and how to build factories and to open mines. At their drawing boards thousands of designers drew blue prints for enterprises the like of which the country had never seen before. The mind of the whole people was tense with effort. In this gigantic work to remake a sixth part of the earth's surface everything had to be deliberated, calculated and weighed up. In that way the state economic plans were drawn up.

And on the lines of these plans the country was transformed. New factories sprang up in places which had until recently been remote corners of the land. New electric power stations gave current to instil life into those factories. New railway lines criss-crossed the wide spaces of the land in order to bring to the new factories the

raw materials they needed and to take away the goods they produced. Everything was seething and moving and growing—the people, with a gigantic effort of will, renewed and enriched their land.

Combating unprecedented difficulties the Soviet people built a powerful industry. Before the Second World War the volume of industrial production of the U S S R exceeded twelvefold that of Russia in 1913.

In the tempo of growth Soviet industry held first place in the world, while in the volume of industrial production it held first place in Europe and second in the world after the U S A.

Equipped with modern machinery, Soviet enterprises provided the country with all the industrial goods it required. The basis of the national economy was the development of heavy industry. On this foundation light industry, agriculture and transport grew rapidly.

The war, fascist Germany's aggression, inflicted enormous damage on the economy of the Soviet Union. The invaders totally destroyed the industries of the western parts of the country. However, as a result of reconstruction work, the pre-war level of industrial production was surpassed as early as 1949. Industry began to work at a higher technical level and to put out more goods than before the war.

In 1959 the U S S R's industrial production was nearly 40 times greater than in 1913 and was considerably more than that of France, Britain and West Germany together.

The U S A., Germany, and Britain needed 80 to 150 years to increase the output of industrial production roughly 30-fold. In 1959 Britain was producing only 80 per cent more than in 1913, in the U S A. production rose about fourfold.

The years 1959-65 in the U S S R are the years in which the Seven-Year Plan for developing the national economy will be fulfilled. This plan envisages another great upsurge in heavy industry, and on this basis the production of consumer goods will make rapid progress.

The Soviet Union has now entered a new and highly important phase in its development—the phase of the comprehensive building of a communist society. The Soviet Union is taking further, decisive

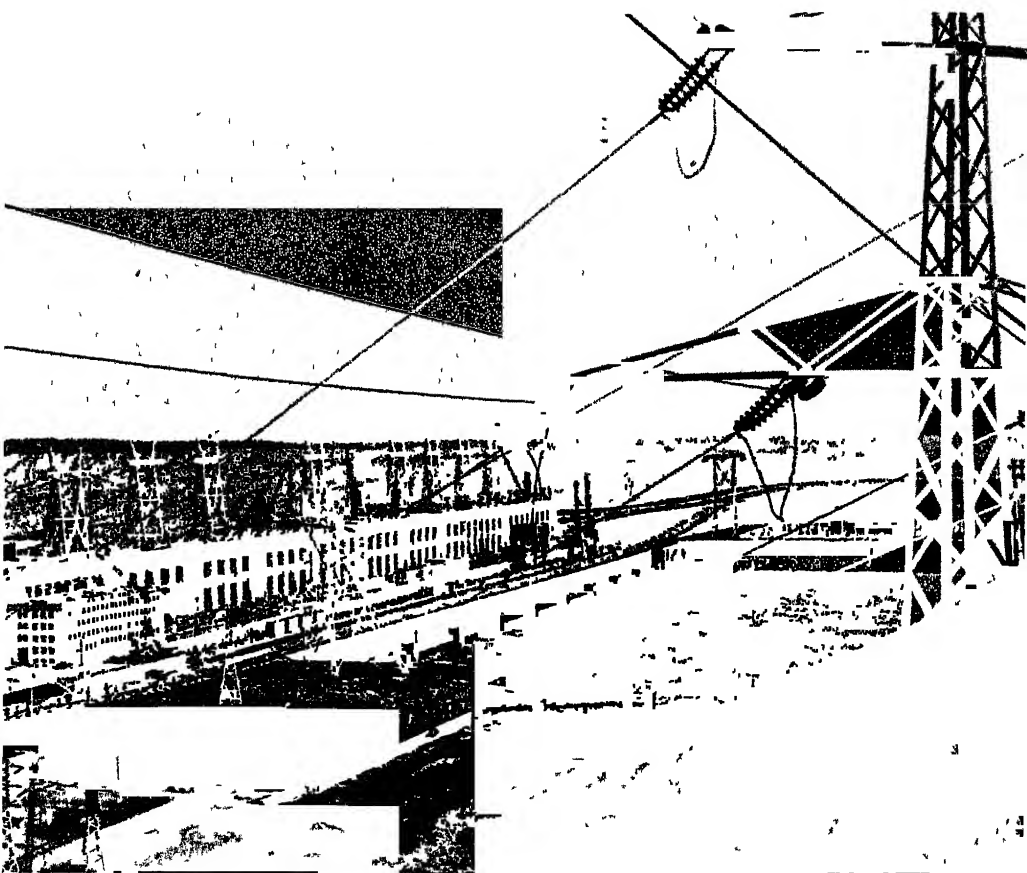


Erecting pylons for the extraction of natural gas at Gazlı in Soviet Uzbekistan



Engineering works at Zaporozhye
in the Ukraine





The Lenin Hydroelectric Power Station on the
Volga near Kuibyshev

steps to solve its main economic task—to overtake and surpass the most developed capitalist lands in per capita production. The Soviet Union now disposes of all the necessary conditions to solve this task in a very short time in peaceful economic competition.

The prospective development of the Soviet Union's national economy during the next 15 years envisages that during this period production in the main branches of industry will be more than doubled or trebled. This long-range plan of development is the economic programme for the construction of communism in the Soviet Union. The U.S.S.R. will advance to first place in the world not only in volume of production but also in per capita production. The Seven-Year Plan for 1959-65 is an integral part of that long-range plan. During the seven years a substantial part of the programme set for the fifteen-year period will be fulfilled.

During the Seven-Year Plan the national economy, and primarily its foundation—heavy industry,—will, as before, grow at a pace many times faster than that of the economic development of the capitalist lands, including the U.S.A. During the years of fulfilment of the Seven-Year Plan the overall output of Soviet industry will increase by about 80 per cent. There will be great technical progress in the entire economy, and labour productivity will increase steeply. The volume of state capital investments in construction will increase 1.8 times compared to the previous seven years, and will be almost equivalent to the volume of capital investment in the national economy during the whole period of the existence of the Soviet state.

Good progress is being made in the fulfilment of the Seven-Year Plan. In 1959, the first plan year, industrial output increased by 11 per cent instead of the 7.7 planned.

Since the establishment of the Soviet state the geographical distribution of the national economy has changed greatly, the main features of this change being the shifting of the productive forces eastward, into regions of greater natural riches which were previously underdeveloped—the regions east of the Volga, the Urals, Siberia.

The enormous construction programme of the Seven-Year Plan will intensify this process. As a result the distribution of the economy will become more even than at present.

COAL

Pre-Revolution Russia was also rich in fuel deposits. But the land suffered persistently, year after year, from a coal shortage—from a “chronic fuel deficit” as it was then said. Although splendid Donbas anthracite was sold abroad, Russia imported a much greater amount of coal herself.

In those days the coal-bearing Donbas in eastern Ukraine was not only the main, but, indeed, the only coal-mining region of the country. It towered gigantically in the coal production chart because it was practically the only region figuring in it: the Donbas provided 87 per cent of Russia's coal, other coal-fields only 13 per cent. The geography of coal deposits was warped to benefit the monopolists of the Donbas. Donbas was the only important coal-mining region in the country which could not provide very much coal in those days: In 1913 its output was only 25,000,000 tons. The mines—“mouse-traps”—were dark, and filled with gas and dust. The miners worked with hacks, pitting their muscles against the hard walls. The coal was hauled by pit ponies. Before the Revolution the coal-mining industry in Russia was but 17 per cent mechanized.

In Soviet times the output of coal in the country has grown more than seventeenfold—from 29,000,000 tons in 1913, to 506,500,000 tons in 1959. “The chronic fuel deficit” has long been eliminated. In coal output the Soviet Union has overtaken the U.S.A. and holds first place in the world.

The miners' working conditions have improved greatly. The transition from an eight-hour day to a six- and seven-hour working day without reduction of pay is being completed. Well-built miners' towns and settlements have sprung up in coal-mining regions. For example, since the establishment of Soviet power the mining settle-

ment of Yuzovka in the Donbas has been turned into the large and well-built town of Stalino. It has, incidentally, two theatres, a philharmonic society, a television centre, three institutions of higher learning, and nine sports stadiums.

Technically the Soviet mines have been re-equipped and have stridden far ahead in this respect. The hewing and hauling of coal, the loading into trucks, which used to be heavy, labour-consuming work, have been entirely mechanized. In the mechanization of the coal industry the Soviet Union leads the world. Rock-loading machines help to remove the rock when new drifts are being worked. A special machine digs a tunnel three metres in diameter. Electric trains carry the miners close to the coal-face, metal "timbering" is used, fluorescent lighting is installed. There are hydromines where the coal is broken off by high-pressure jets of water. Extensive application is made of the cheapest methods of mining—open-cast mining with the assistance of excavators, the productivity of labour in open-cast mining of coal is almost seven times higher than in pits.

In these days it is the coal combine that is beginning to set the main fashion in the pits of the U S S R.

Not long ago in all pits the coal had to be removed by spade, although it was being hewed from the face mechanically—with automatic picks or drills. The combine not only mechanizes the hewing of coal but also replaces the work of the loader who used to load the hewn coal manually on to the conveyor-belt.

In the bright light of the headlights the machine rumbles along the drift, hews the coal, removes it from the face and itself loads it on to the conveyor. In three minutes the combine mines as much coal as a miner using a hack hewed in a whole day in pre-Revolution Donbas.

The stream of coal pours into the trucks which run behind the electric locomotive to the lift, and the lift brings the coal up to the bunkers which tip it into railway waggons. The train bears the coal away from the pit where, during the entire process of mining, it has not been touched by human hand.

Before long manual hewing and loading will have been totally eliminated. The timbering of the mines will also be done without manual labour. Then mechanization will have become complete. Automation will be introduced on an increasing scale.

It is not only the look of the Donbas that has changed during Soviet times, its role in the country has changed too. Located in a densely populated part of the country, where there are many factories, railways and towns, the Donbas remains the principal stokehole of the Soviet Union. Its coal production has increased greatly. But at the same time its proportion in the country's total output has diminished. Before the First World War the Donbas gave Russia 87 per cent of her coal, now it gives only about one-third.

These facts speak for themselves: the old coal-mining region grew fast, but the new, younger ones grew still faster. New industries appeared in the eastern parts of the country and called for the appearance of new coal basins too.

The entire coal output of pre-Revolution Kuzbas in Western Siberia went into the tenders of the Siberian railway engines. Its riches were merely fingered. The industrialists of tsarist Russia could not bring to life a basin which is probably unique in the world for the quality and calorific content of its coal.

In the Kuzbas there lies several times more coal than in all Britain, the famed "stokehole of the world." Kuznetsk coal lies close to the surface and is cheap to mine. It is good for fuel, for blast-furnace smelting, and for the chemicals industry. It contains little ash and little sulphur. The thickness of the seams sometimes attains the height of a five-storey house.

Once, during the early years of the Revolution, the workers of the Kuzbas asked Lenin for an electric power station. The only thing available for them then was a dynamo machine from the Maly Theatre in Moscow. Now the Kuzbas alone gives more coal than all tsarist Russia did. And on the coal of the Kuzbas there has arisen in the heart of Siberia an industry that provides coke, steel, nitrogen, ferro-alloys, aluminium, machines...



A coal-combine at work in a colliery in the
Donbas (Ukrainian S.S.R.)



An excavator at the Sokolovka-Sarbai iron ore mines in Kazakhstan

At Karaganda which is also beyond the Urals, in Kazakhstan, two small coal-mines—one blown-up, the other flooded—remained from pre-revolutionary days. During the First Five-Year Plan train loads of equipment and technicians were sent there from the Donbas. Kazakhs went to the Donbas to study mining. So the old mining region helped the new one into life. Russians and Ukrainians helped. Kazakhs. Karaganda became the Soviet Union's third coal base.

Kuzbas and Karaganda dealt a decisive blow at the old, distorted, lop-sided geography of coal. The industries of the East, above all of the Urals and Siberia, received a spring-board. A real, stable foundation was provided for the entire industrial advance of the country's eastern regions.

And as time has passed this foundation has become more stable. The eastern regions already provide about one half of all Soviet coal.

But is it not only in the east that industrialization is on the upgrade? The same is happening in the north. The factories, ships and railway engines of Arkhangelsk, Murmansk, Kotlas, and, especially, Leningrad, need coal. So a northern coal base was established—the Pechora coal-field, around the new town of Vorkuta.

Straight to the Arctic Circle itself, through dense forests and across rivers, a railway now runs. The first train arrived at Vorkuta at the end of 1941.

Pit after pit was sunk, a district heating plant installed, a new town built.

In those parts the last of the snow melts only late in June and there are frosty nights as early as August. Spring, summer and autumn combined last a mere three months. For the rest of the year the winter reigns, with Northern Lights, frosts of 40°C and 50°C below zero, with blizzards that attain a speed of 40 metres a second.

The pits have been sunk in eternal frost—in earth as hard as iron. The whole course of the coal from the face to the railway bunkers runs through heated galleries. The concrete used in the walling has to be heated electrically when being laid.

A substantial supply of coal goes from the Pechora collieries to the country's industrial centres, notably to Leningrad.

The Donbas' share in the Soviet Union's coal supplies has fallen not only as a result of the growth of the Kuzbas and Karaganda coal basins which supply the whole land, but also because pits of smaller output have been sunk all over the country

Uzbekistan has provided itself with a "stokehole" at Angren Georgia has put into commission mines at Tkvarcheli and Tkibuli. In the part of the Ukraine that lies west of the Dnieper brown coal is extracted in the Lvov-Volhynia Basin Along the Trans-Siberian Railway coal workings have grown up in the Kansk-Achinsk and Cheremkhovo basins, and at the coal-mining centres of Bukachacha, Raichikhinsk and Artem Ekibastuz in Kazakhstan has begun to play an important role

The largest of the local coal basins lies near Moscow The Moscow Coal Basin constitutes the "local" basin for the central part of Russia But the "locality" which it has to serve is highly industrialized so that the Mosbas is, in fact, of significance to the economy of the whole land

The coal of the Mosbas is of low quality It gives much ash and comparatively little heat and it is therefore uneconomic to transport it over great distances But long hauls are not necessary in the close vicinity lie such big consumers of coal as the electric power stations of Central Russia, and the factories of Moscow, Tula, Podolsk and Noginsk At those places it is burnt in furnaces specially designed for the purpose

The Mosbas has grown with a startling rapidity Before the Revolution its quarterly output barely reached that of the Donbas for one day But now it is itself Moscow's Donbas.

So new coal centres are growing and becoming more important in the country and the map of the coal industry of the U.S.S.R. shows a continual process of more even distribution

Towards the end of the seven-year-plan period coal production in the U.S.S.R. will reach 600,000,000 to 612,000,000 tons annually, i.e., an increase of over 20 per cent This increase will be attained by the reconstruction of old pits, the sinking of large new pits and the development of open-cast mining. Special attention will be paid

to cheap open-cast and hydraulic mining. A big programme has been mapped out for improving miners' working conditions.

The displacement of the coal industry eastwards will continue. It is in Siberia and Kazakhstan that the largest deposits suitable for open-cast mining are located. For example, in Ekibastuz in Kazakhstan the coal seams lying close to the surface of the earth are over 100 metres thick. Their work is conducted with the assistance of powerful excavators which load the coal straight into railway trucks. On the basis of the cheap coal of the east the U.S.S.R. is building up a mighty power industry.

OIL

Important changes are taking place in the fuel balance of the Soviet Union according to plan: the share of coal is diminishing and that of the more efficient fuels—oil and gas—is increasing substantially.

The share of oil and gas in the total volume of fuel production during the next seven years will increase from 31 to 51 per cent, and the share of coal will fall from 60 to 43 per cent. This entails great advantages, both technical and economic. In particular, diesel locomotives will be used as well as electric locomotives on the railways; the gases obtained during oil-refining will be used to an increasing extent by the chemicals industry.

All this will lead to an intensified development of the Soviet oil industry.

Before the October Revolution the geographical lop-sidedness of the Russian oil industry was even more marked than that of coal-mining, to which reference has already been made. The Caucasian oil monopolists held undisputed sway in the oil industry. Ninety-seven per cent of Russian oil was produced there. Baku provided 84 per cent, the Grozny region 13 per cent.

Now this one-sidedness has been eliminated. In the middle of the country, between the Volga and the Urals, a new oilfield richer than

Baku has been opened up That has appeared on the oil map as the result of persevering prospecting

In 1932, oil was struck during prospecting in the foot-hills of the Urals and in Bashkiria, near Ishimbai The derrick was completely smothered in black oil Later, oil was found at Krasnokamsk, near the Bashkirian village of Tuimazi, and at Buguruslan In 1937 more oil was found, this time on the Volga, first near Syzran, then near Stavropol, and, finally, near Saratov The oil was found to be sulphurous but rich in light hydrocarbons It serves not only as fuel but as a good raw material for the chemicals industry

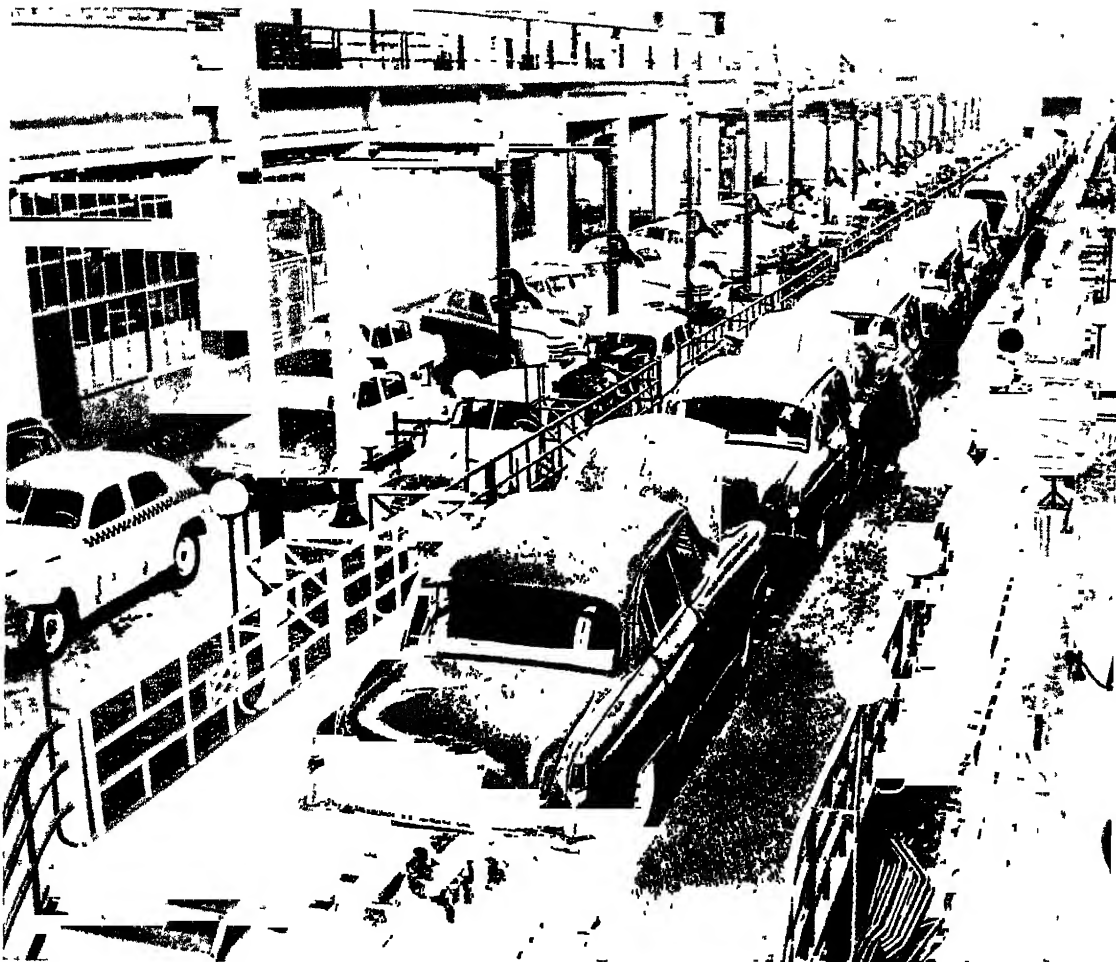
But that is not the end of the story.

The oil of Baku is relatively young But in the new region much older oil was found Yet even this oil was not as old as Soviet scientists had reckoned to find They had hoped to find oil there not only in the Carboniferous and Permian formations but in the more ancient Devonian formation whose age is calculated to be about 300,000,000 years The depth of the bed of the Devonian formation was estimated in advance The oil prospectors bored down to the Devonian formation at very many points between the Urals and the Volga It was first reached near Syzran But this was only half a victory the Devonian formation was found to lie at the depth the geologists had forecast, but no oil was found

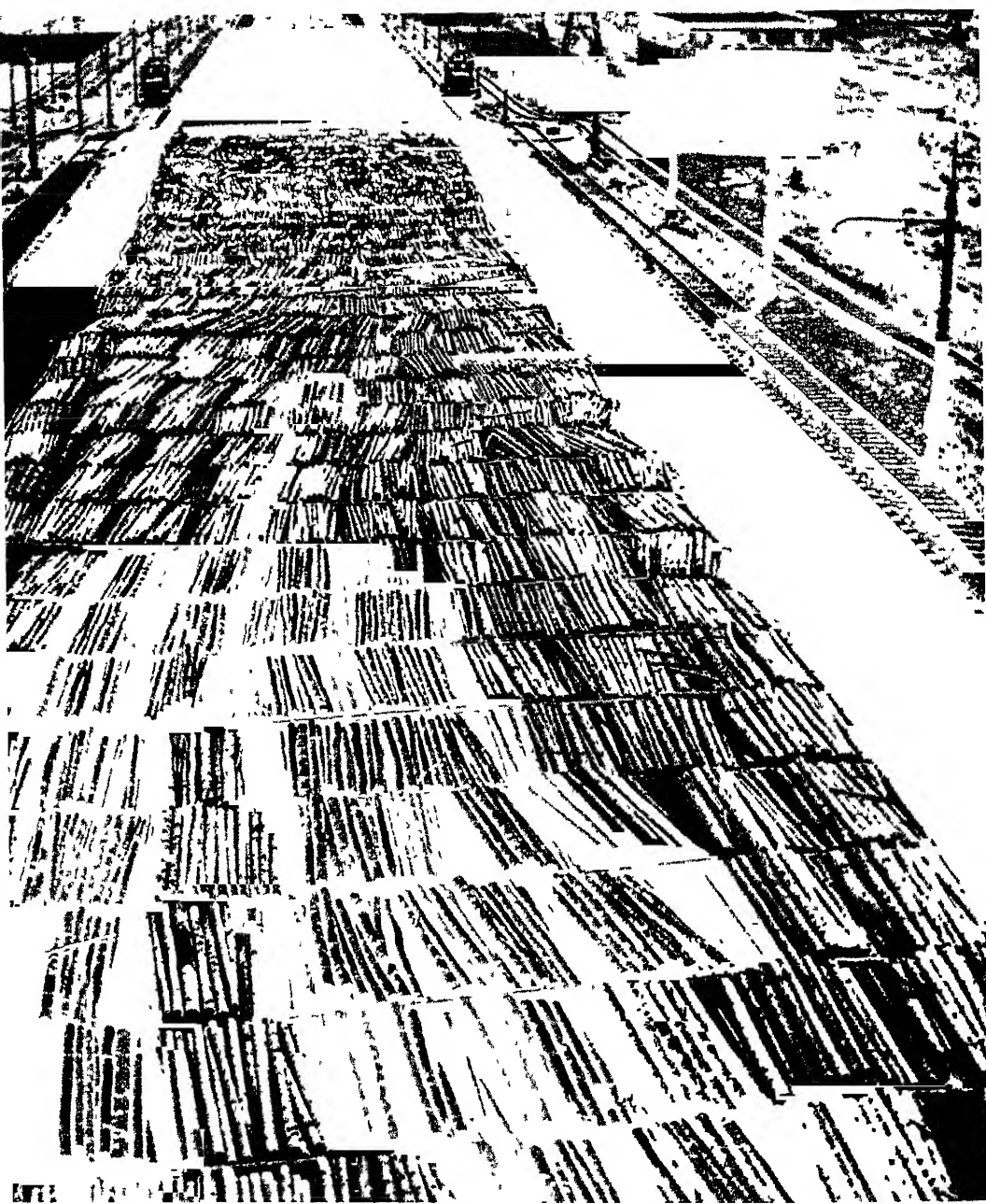
The struggle went on Prospecting was not interrupted even by the war, when battles with the German invaders were being fought on the Lower Volga And in 1944 a gusher of Devonian oil spurted from the mouth of a tube that had been sunk to a depth of $1\frac{1}{2}$ kilometres into the earth at the Zhiguli Hills at the banks of the Volga

A few weeks later, the deep Devonian formation was tapped near the Bashkirian village of Tuimazi. The main street in the new town of Oktyabrsk which has grown up near the Tuimazi oilfield has been named Devonian Street and the local hotel there is also known as the Devon

Finally, rich deposits of Devonian oil were discovered in Tataria too The Tatar Republic has become a source of oil Large reserves have been found there



"Volga" cars on the conveyer belt at the Gorky Auto Works



Conducting timber rafts by electric locomotives
through a lock at the power station on the
Kama River near Ferm (Urals)

The deep Devonian formation is much richer in oil than the Carboniferous and Permian formations which lie nearer to the surface, and on which work began in these regions first

The new oil-bearing region is being constantly extended. Fairly recently, for instance, oil was struck outside Stalingrad

In the Volga-Urals oilfields various methods for artificially maintaining the pressure in the oil strata are being applied successfully. This increases the quantity of oil extracted from the earth

In the south the new oil region adjoins the extensive and highly-promising Emba oilfields. Before the Revolution, oil extraction had only just started at Emba, near the north-eastern shores of the Caspian Sea. There were two small fields, at Dossor and Makat. Soviet geologists located a large number of salt cupolas under the scanty soil of the desert which had once been the flat bed of a sea. These cupolas contain much oil. In these regions there have been gushers which have thrown up as much as 13,000 tons of oil in a day—a whole lake of oil.

At the present time Emba is one of the main oil-bearing regions of the country. The oil extracted here is practically free from sulphur, and is suitable for the production of the best qualities of petrol and lubricants.

Water-pipes have been laid to the waterless oilfields. Settlements have been built, trees and shrubs planted. These arid parts have been freshened for the first time with foliage.

To the north of the new Volga-Urals oilfield Soviet geologists have studied the oil-bearing region of Ukhta. There an extensive field of oil and natural gas is being developed; though it lies in the taiga close to the Arctic zone, it has been as accurately and fully mapped as the outskirts of Moscow.

In addition to the Volga-Urals region, Emba and Ukhta, new oil derricks continue to rise on Sakhalin Island and in Central Asia. The oilfields of the Carpathian foot-hills, the Kuban and Grozny are being greatly expanded.

Hitherto, the whole of mighty Siberia lacked its own oil. But in recent years the first indications of the existence of oil in Siberia

have been received This discovery will have tremendous significance

New life has come to old Baku too Now nearly nine-tenths of Baku's oil comes from strata discovered and investigated since the Revolution

In old Baku oil was scooped out of oil wells with small, long, narrow, open-bottomed buckets In the Soviet oilfields oil is obtained by electric compressors and pumps For the first time turbo- and electro-drills drive down into the ground Soviet turbo- and electro-drills are famed throughout the world

Methods have been devised for boring slanting drill-holes as well as vertical ones This enables the prospectors to reach oil under buildings and under the off-shore sea bed (there is oil under the bed of the Caspian Sea near Baku The submarine oil zone stretches for many hundreds of kilometres)

With the use of newly-perfected machinery, oil borings can be made to a depth of 5,000-6,000 metres But that is not the limit At the present time Soviet technologists are devising drilling equipment for boring to a depth of 10,000 metres

Oil derricks are being built in the sea itself—on metal bases There are hundreds of such derricks near Baku In some places they are located tens of kilometres from the shore

Many of these off-shore derricks are connected by piers Entire settlements have risen over the sea, containing electricity and compressor stations, enormous tanks, two-storey houses, shops, clubs, post-offices. One of the largest oilfields in the U S S R, the "Nef-tyaniye Kamni," is built this way

As a result of its reconstruction in Soviet days the Baku oil industry gives much more oil than previously. But with the growth of new oil regions the share of Baku oil in the Soviet Union's total production has fallen sharply. Baku's fate has been that of the Donbas

In 1959 Soviet oil production reached 129,500,000 tons, which is 14 times more than before the Revolution. In other words, the Soviet Union is producing more oil in a month than tsarist Russia produced in a year

In 1965, at the end of the Seven-Year Plan, the U S S R will be producing 230,000,000-240,000,000 tons of oil a year. This means that present production will be more than doubled in seven years.

Much attention will be paid to further improving the technology of oil production, in particular by increasing the speed of boring and by introducing methods which will enable oil workers to take the oil from the bowels of the earth more completely.

A substantial growth in the oil-refining industry will take place under the Seven-Year Plan. It will be developed in a number of new regions, particularly in Siberia.

Several new pipelines will be laid. The total length of oil pipelines in the country will be almost trebled. This will substantially reduce the expensive transportation of oil and oil products by rail.

GAS

Pre-Revolution Russia had practically no gas industry. Only in the very large towns could one find small gas-works for street lighting.

The gas industry founded in Soviet times has made particularly rapid progress in recent years. The lag in this sphere is being made up for at a constantly-accelerating pace. The rapid growth of the extraction and production of gas is improving the structure of the Soviet Union's fuel balance and is providing industry and the population with a more convenient and cheaper fuel.

Every country has its industrial regions which are deficient in local sources of power. The Soviet Union too has such regions—Central Russia, for example, including Moscow. Here fuel is brought from afar along endless routes. Now a fuel that is calorific, convenient, cheap, and at the same time transportable, has been found for the regions located far from coal deposits. This is gas.

Gas was discovered during the war at Elshanka, near Saratov on the banks of the Volga. The gas layers were reached by boring and a light-blue fountain jetted into the air to a height of a twenty-storey

house. The column of almost pure methane roared and hissed deafeningly from the earth under a pressure of up to 80 atmospheres. During the battle of Stalingrad, when the Volga was closed for the transport of Donbas coal and Caucasian oil, the Elshanka gas was brought in pipes to the furnaces of Saratov factories. Later, towards the end of 1944, a start was made on building a gas pipeline from Saratov to Moscow. In the summer of 1946 Moscow received its first Saratov gas. It had come in an underground pipe 843 kilometres long and consisting of 100,000 welded joints.

There is much natural gas in the Carpathian foot-hills. From Dashava a pipeline 513 kilometres long was laid after the war to Kiev and then extended to Moscow. Recently a pipeline reached Moscow from a third source of gas—the North Caucasus. In Moscow today practically all homes are supplied with gas.

Natural gas is used to heat Lvov, Baku, Grozny, Ufa, Stalingrad, Oktyabrsky, Nebit-Dag, Andizhan and many other towns.

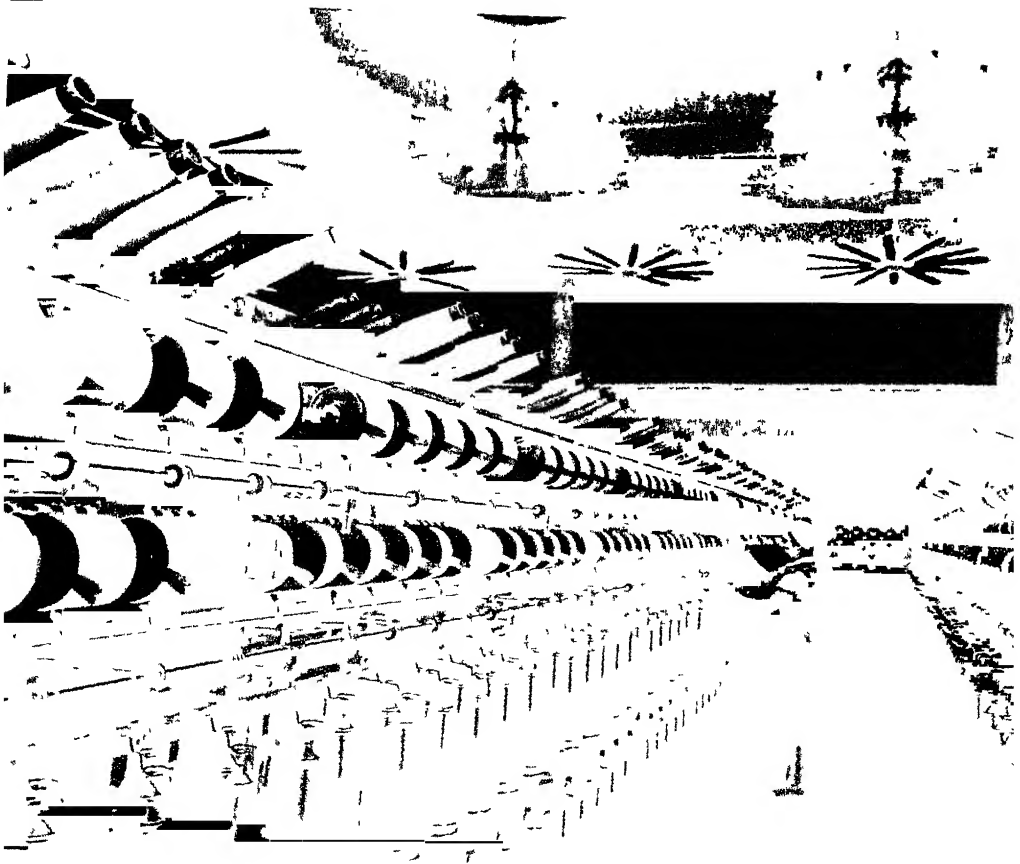
Natural gas is, of course, the most advantageous form of gas. It is mainly on this that the Soviet gas industry is based. However, nature has not provided every region with deposits of this cheap and convenient fuel. Sometimes it is necessary to look for sources of artificial gas.

Leningrad lies still farther from coal supplies than Moscow. Before the war coal was being brought to Leningrad at the rate of one railway truck a minute. Leningrad also needed gas.

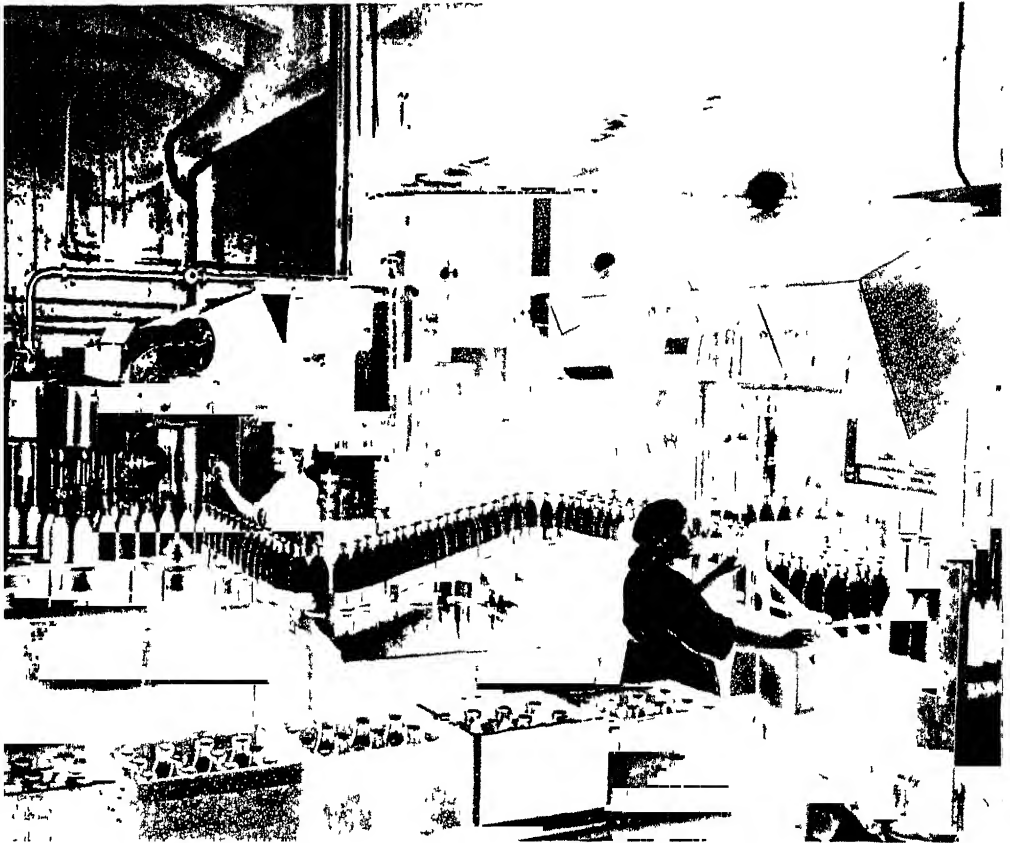
There are big deposits of combustible shale at the southern coast of the Gulf of Finland in Estonia. At the Kohtla-Järve it is converted into gas and sent to Leningrad in a 203-kilometre pipeline. More gas goes from Kohtla-Järve to Tallinn, the capital of Estonia, through a pipeline nearly 150 kilometres long.

Previously, gas was not produced from combustible shale. The method of producing it from coal was more widely known. Near Tula a works for making gas out of Moscow Basin coal has been built. This also serves Moscow.

But you can transform coal into gas not only in gas-works, it can be done underground, at the source of coal. The idea of the subter-



Production of kapron thread at the Klin mill
(the Moscow Region)



At a Leningrad dairy

anean gasification of coal was suggested many years ago by the great Russian chemist Mendeleev, the creator of the Periodic System of the elements

Lenin noted the idea and expected much of it. The point is not only that in gasifying coal underground the expense of building a pit is obviated. The main thing is that it frees human beings from arduous underground work.

This idea, which had its birth in Russia, was first put into practice in Soviet times. Experiments were conducted. Before the war the underground gasification of coal was set going at a special research station in the Donbas. The gas was supplied to a coke-chemicals factory. Later, an improved station was established in the Moscow Coal Basin.

At the present time work is in progress on the underground gasification of coal in several regions. The practical aspects of the problem have been solved.

The Seven-Year Plan envisages a very rapid growth of the gas industry. The annual extraction and production of gas is to increase from 30,000 million to 150,000 million cubic metres, in other words fivefold.

Gas will serve both as a source of chemical raw materials and as fuel.

As in the oil industry, automation and remote control methods for the main technological processes will be introduced on a wide scale into the extraction of gas.

During the Seven-Year Plan much attention will be paid to building pipelines for gas supply. It is planned to lay 26,000 kilometres of main pipelines with branches into the towns.

Gas is in particularly great demand in the European part of the Soviet Union and in the Urals. It is there that the main network of pipelines will run. In the European part of the Soviet Union new gas pipelines will run from the gas-bearing foothills of the Caucasus and the Carpathians northwards, to Moscow, Leningrad and other large centres. To the Urals they will run from the Volga and, mainly, from Uzbekistan where an enormous supply of gas was struck re-

cently near Bukhara (Gazli) Large distances will have to be covered by these pipelines. For example, from Bukhara to the Urals the distance is over two thousand kilometres These pipelines will be very large—with tubes up to one metre in diameter

ELECTRICITY

Not the armature of the electric motor but the piston of the simple steam-engine moved the machinery of most of tsarist Russia's factories Only the largest towns were lit by electricity, most used kerosene Power stations were few and small-scale

The building of a new, socialist society could not be undertaken without the development of a large machine-building industry. And only electricity could serve to change the economy of backward Russia on the stable technical basis of a powerful industry Lenin said: "Communism is Soviet power plus the electrification of the whole country"

At the present time the Soviet Union is covered with a dense network of electric power stations Many of these stations produce heat as well as electricity hot water flows through pipes to houses and factories, in this system of district heating the Soviet Union leads the world In some places very large stations—known as district heating stations—have been built

Those power stations which are relatively near to each other are linked in single systems—grids Even factory power stations, as, for example, the Magnitogorsk Power Station, work in a general network. Should an accident occur or some precautionary repair take place, the factories continue to work the stations, as it were, hold each other's hands, like people in a round dance

These grids are enormous The Central Grid covers the whole territory between the Volga and the Oka—from Moscow to Rybinsk, Ryazan and Gorky. A single grid interlinks the Industrial Urals from north to south. The power stations of the Kuzbas are interlinked too.

These large grids are now being coupled with each other. The electric power system of the Dnieper has been connected with the

Donbas system, so that practically half the Ukraine is now covered by a single grid. Not long ago the Volga stations were linked up with Central Russia and the Urals.

During the Seven-Year Plan an important step will be taken towards establishing a single electric grid for the whole country. Single electric systems will be formed in the European part of the Soviet Union and in Central Siberia, and the systems in the North-West and West of the U.S.S.R. Transcaucasia, Kazakhstan, and Central Asia will be combined into single grids.

The time is not far off when every power station in the country will be linked. The power resources of the whole land will be drawn into the national economy by a single network, irrespective of where they are located. The substitution of electricity—more convenient, more easily transmitted—for other fuels will reduce the strain on the transport system. A single network of power stations will provide abundant electricity to the whole country and will become the backbone of a rational and more even distribution of productive forces.

Incidentally, the range of the electricity system, considered not only in terms of longitude but of latitude too—the linking of Moscow with the Volga Basin and the Urals, for instance—takes into account the “time factor.” The demand for electricity is greatest in the evening, and especially during the hour or two on December afternoons when darkness has already fallen though the working day is not yet over. Single stations have to hold part of their generators in reserve in order to cope with this sharp peak in demand. But between Moscow and the Urals, which are 1,500 kilometres apart, there is a time difference of two hours. The time difference between Moscow and the Middle Volga is one hour. So when evening falls the greatest strain on electricity resources begins in the Urals, an hour later it is felt on the Volga, and after yet another hour in Moscow. The electricity is distributed according to demand, at first there is an increase in supplies to the Urals, then to the Volga Basin, and finally to the central regions. This, of course, reduces the cost of electricity.

Before the Revolution the power stations burned high-calory fuel

Their furnaces consumed valuable products which can serve as chemical raw materials or as fuel for blast-furnaces. Even the Baku stations worked on oil though they might have been run on gas. Anthracite dust was not used at all. Peat, brown coal and combustible shale lay idle.

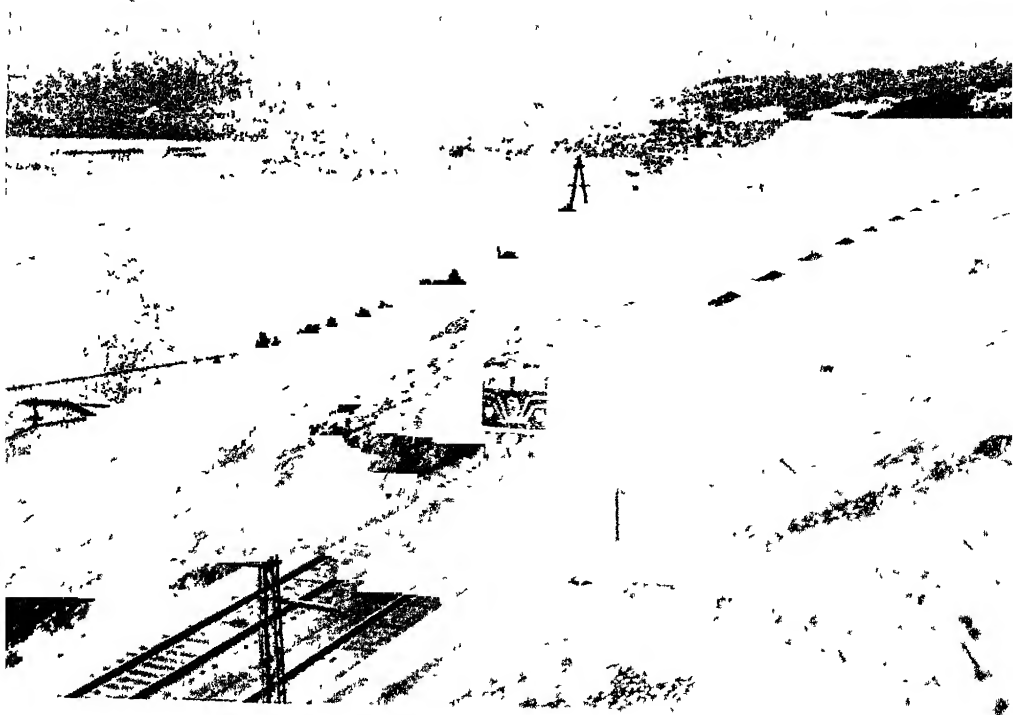
But the trouble was not only that valuable products were being consumed. Much of the oil and hard coal used in the central regions had to be shipped from the Caucasus or the Donbas, thousands of kilometres away.

Soviet power stations, especially the new ones, use in the main cheap local fuel. They are built where they are needed but every effort is made to find fuel for them locally, so that it does not have to be shipped from afar. The Stalinogorsk and Kashira stations are located near the low-quality coal deposits of the Moscow Basin. The Chelyabinsk Station in the Urals uses local brown coal. The Ivanovo, Balakhna and Shatura stations in the central regions burn peat from the adjacent bogs. The Zuyevka and Shterovka stations in the Donbas use anthracite dust. The stations at Baku and Saratov burn gas. The big new power stations of Siberia are based on cheap coal obtained by open-cast mining.

The most "local" of all fuels is peat. It does not pay to move it more than twenty kilometres. However, the regions that are rich in peat are often quite lacking in coal deposits, and by burning peat at power stations built close to the workings, great savings are effected in the transport of coal. That is what is done, especially in the Ivanovo, Yaroslavl and Gorky regions, and in Byelorussia.

At one time Ireland alone extracted several times more peat than Russia. Now the U.S.S.R. extracts several times more peat than the entire capitalist world.

Peat is no longer dug out of the bogs by hand. This is also done by machinery. It is washed out by the jets of powerful hoses, or crumbled and raked, or taken out in the scoops of excavators and spread for drying in briquettes. Factories are being built for the artificial dehydration of peat—this enables it to be dug in rainy weather.



Electrified railway on the shore of Lake Baikal
in Siberia





Cattle of a state farm near Moscow

On the basis of local low-quality fuel—peat—transformed into electric current, industry has sprung up in places where at the lower level of technology its development would have been hampered by the absence of high-grade fuel. Electrification helps a more even distribution of industry, a more complete deployment of industrial forces.

In 1959 the power stations of the Soviet Union produced 264,000 million kw-h of energy. That is nearly 140 times more than tsarist Russia produced.

Power stations are still being built on a broad scale. The present Seven-Year Plan marks a decisive stage in the fulfilment of Lenin's idea of the complete electrification of the country. The total capacity of power stations is to be more than doubled. In other words, power stations will go into operation producing more electricity than the capacity of all the power stations built since the Revolution. Another comparison: this is almost as much as Great Britain, France and West Germany together have built and put into operation during all their existence. In 1965, the last year of the Seven-Year Plan, the output of electricity in the U.S.S.R. is to reach 500,000 million-520,000 million kw-h. By the end of the Seven-Year Plan the Soviet Union will surpass the present figures for Great Britain and France in the per capita output of electricity.

In the Soviet Union tremendous work is in progress for the peaceful uses of atomic energy. In 1954 the world's first atomic power station went into operation in the Soviet Union.

New atomic power stations are under construction. These power stations will be located in the big power systems of various parts of the country, predominantly in those parts where fuel resources are relatively limited (in particular, the Urals, the Voronezh Region, etc.).

The building of hydroelectric power stations is not, at present, the main task of Soviet engineers. Although these stations are cheap to run, they take a long time to build. In order to hasten the pace of the construction of communism, the Soviet people are now concentrating on big thermal stations. These take much less time to build. In order

to keep down the cost of the electricity they produce, these thermal stations are, as before, usually planned to run on cheap fuel: coal from open-cast workings, natural gas, mazut. Nevertheless, hydro-power stations are not by any means losing their importance in the U.S.S.R. They are specially important in those regions which have a deficiency in cheap fuel.

In tsarist Russia there were virtually no hydroelectric power stations. In Soviet times dozens of them have been built in all parts of the land. Some are in the far south—on the Kura, or on the Rion—where the climate is so warm that the rivers never freeze. Others have been built in the Far North—on the Niva and on the Tuloma, where in summer the builders have to struggle with bogs and in winter the frozen ground blunts the spade, the frost grips the concrete mass and the underwater ice clings to the blades of the turbines. Power stations have been built on the flat Volga valley—at Ivankovo and Uglich; and in the foaming gorges of the Pamir rivers near Khorog. A water tunnel has been bored through a mountain near Kutaisi. A green hollow has been filled with water on the Khrami where the water falls from a great height through pipes to the turbines. On the banks of the River Svir a large power station was built with a deliberate tilt on the clayey soil: when the ground settled the building righted itself. And on the Don the builders erected the Tsimlyanskaya Power Station without fearing its sandy foundations.

On its way to the sea the Dnieper broke through a salient of the ancient crystalline foundations of the Shield of Russia. For almost 100 kilometres its bed was strewn with boulders and broken with rapids. These rapids divided the navigable river into two disconnected parts.

During the first five-year plan period the ribbed concrete arc of the dam of the Dnieper Power Station was flung across the river, raising the level of the water by 37 metres and forming a great lake. The rapids were covered. The Dnieper was turned into a completely navigable river crossed by a chain of locks. Europe's biggest hydroelectric station gave cheap electricity to the Ukraine.

During the war this power station—the Dnieproges—was destroyed. But as early as 1943, when the war was at its height, a new, resurrected Dnieproges was planned. And when the enemy was driven back from the banks of the Dnieper the Soviet people set to work amidst the ruins of the power station. In spring 1947, the first of the new, still more powerful turbines of Dnieproges went into operation. And soon the whole station was running.

But the reconstruction of the Dnieper did not end with the building of Dnieproges. The river had not yet yielded up all its power. After the war, another power station, with half the capacity of Dnieproges, was built on the river nearer to the sea—the Kakhovka Power Station. This intercepts the water that has flowed through the turbines and sluices of the Dnieproges dam, converts it into power and in the future will help to irrigate the steppes of South Ukraine with Dnieper water. Hydropower stations are at present under construction on the river above Dnieproges, in particular, near Kremenchug.

Many power stations have been built in Transcaucasia, the biggest being at Mingechaur. At a place where the Kura bursts on to the plains through a narrow gorge in the Boz-Dag Range, a high dam was built out of two million truck loads of sand and gravel. The Kura provides electricity and irrigates dry land.

In Uzbekistan the newly-built stations include the Farkhad Station on the rapids of the Syr-Darya, near Mount Mogol-Tau, this station is one of the biggest in the Soviet Union. Its dam facilitates the irrigation of the Hungry Steppe. Elsewhere on the Syr-Darya the big Kairak-Kum Station is under construction.

Hydropower stations are being built in many other parts of the Soviet Union. We shall deal with the building of power stations on the Volga later, in the section on the Volga.

The most interesting aspect of the question of hydroelectric power station construction in the Soviet Union is connected with the fact that the time has now come to build power stations on the great Siberian rivers. This means that the Soviet people have reached their

main water resources which have remained untouched since time immemorial.

On the Irtysh the big Ust-Kamenogorsk Power Station has been built, providing electricity to the mines of the Altai. Farther upstream, near the estuary of the mountain river Bukhtarma, another power station, the Bukhtarma Station, is being built on the Irtysh. Its high dam will close a narrow valley and form an artificial lake almost the equal of Lake Baikal. In the upper reaches of the Irtysh the level of Lake Zaisan will rise almost ten metres, overflow its banks and change the lake's contour.

Thirty kilometres from Novosibirsk the first of the Ob power stations has been built. It gives electricity to Siberian industry and railway transport.

The Amur and the Lena are awaiting their hour to strike but a start has already been made to harness the Yenisei and its tributary, the Angara.

The Angara is a wide river, its waters, which never freeze, burst out of Lake Baikal, fast flowing and clear. Then, to the rustle of the pebbles on its bed, the river strives northward, seethes at the rapids in basalt gorges, swings west and, dropping 380 metres over a course of 1,830 kilometres, flows into the Yenisei.

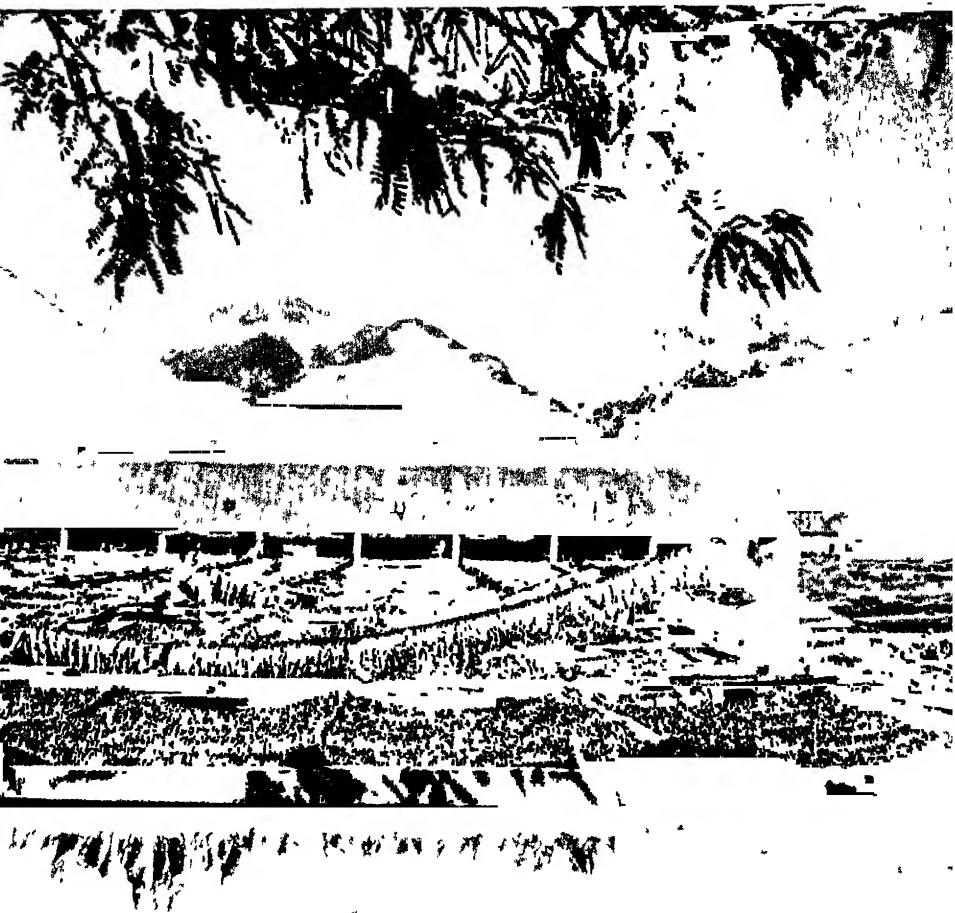
No river in the world is so attractive to power station builders as the Angara. Deep and swift, it is capable of putting into motion the turbines of several power stations, one after the other, and of producing as much electricity as the Volga, Kama, Dnieper and Don combined can give. And its rocky banks are suitable for dam building.

But the main thing is that no other river can produce electricity as cheaply as the Angara. The cost per kw-h at one of the stations planned for the Angara will be less than 0.5 kopek. The stations will work evenly, without abatement, not a single drop of water will run over the crest of the dam. The water resources of Lake Baikal guarantee the Angara's even flow.

But that is far from all: around lie uncounted riches, awaiting but to be fully used. There is the coal of Cheremkhovo—one of the cheap-



Mechanized maize harvesting in the Irkutsk Region



Tobacco drying in Georgia

est in the country There is the iron ore of the banks of the Angara, the salt of Usolye-Sibirskoye, raw material for aluminium, rare metals, and endless forests of tall, straight pines All this is destined to become the products of gigantic combines supplying the country with electricity, electric steel, aluminium, coal, petrol from coal, artificial silk, and light industry goods.

The first hydroelectric power station on the Angara has been built near Irkutsk Lower down the river the gigantic Bratsk Station is under construction Its capacity will be 4,500,000 kw It will be completed during the Seven-Year Plan Soon after a still more powerful station, with a capacity of 5 million kw will be put into commission on the Yenisei above Krasnoyarsk It is already under construction

Altogether, six power stations with a total capacity of about 70,000 million kw-h will be built on the Angara The chain of power stations on the Yenisei will produce about 100,000 million kw-h.

Siberia is emerging in the front row of the world's industrial areas

FERROUS METALLURGY

Two centuries ago Russia used to supply metal to European lands, including England—metal from the Urals was considered first-class, as good as Swedish But later, Russia allowed other lands to outstrip her by far in the making of metal Before the Revolution much of the metal used in Russia was imported Not only copper, tin, lead and zinc were bought abroad Even a proportion of iron and steel had to be imported The ferrous metals industry of pre-Revolution Russia lagged far behind that of America and Germany.

The Soviet land could not exist without machinery. And to have machinery it had to have metal The U S S R created its own powerful, advanced metal industry, both ferrous and non-ferrous

In Soviet times the old metal works were totally reconstructed and new ones built The Soviet Union is self-sufficient in iron ore, steel, non-ferrous and rare metals It has mechanized blast-furnaces and open hearth furnaces, more capacious, as a whole, than those,

At the two ends of this line, iron ore, steel and rolled metal, the product of Siberian coal and Urals ore, began to pour out of the furnaces of new works

The raw materials for the metal had to be transported by rail over long distances. Magnitogorsk lies 2,400 kilometres from Stalinsk in the Kuzbas. But the Magnitogorsk ore was rich in metal and, above all, cheap—it is mined not from pits but on the surface. Kuzbas coal yields an extremely pure coke and is also cheap. The big pits where it is extracted are highly mechanized. These raw materials justify the cost of the long haul.

The metal of the Urals-Kuznetsk Combine turned out to be cheaper than that of the South.

There is no longer any need to haul Ukrainian metal to the East—this saving in transport cost has alone long since compensated for the cost of the metal works of the UKC.

The Urals end of the combine is formed by the new metal works at Magnitogorsk, Nizhny Tagil, Chelyabinsk and Novo-Troitsk.

Near the foot of the Magnitnaya Hill in the southern Urals a huge metal works has been built. It alone produces more metal than all the ferrous metals industry of tsarist Russia.

Excavators dig out the reddish-brown ore, electric trains run it off quickly to the concentrating works, to the crushers; then the ore goes to the furnace shop where automatic waggons lift it to the maw of gigantic blast-furnaces. The liquid pig iron pours in a blinding stream into the mobile buckets which bear it off to the open hearth furnaces before it has time to cool. The incandescent steel pigs are carried by rollers to the bloomings. The rolling-mills press it, squeeze it, crush it flat, and turn it into sheets and beams. Close at hand, coke from Kuznetsk and Karaganda coal glow in tall furnaces. And not far away from the blast-furnaces and the factory buildings, the Magnitogorsk thermal power station smokes. The Magnitogorsk Metal Works are still being expanded. During the Seven-Year Plan the output of rolled steel at the Magnitogorsk Combine will increase from 5,200,000 to 8,500,000 tons a year. Within a few years the works will be fully automated.



Milking cows at a Kuban collective farm
(Krasnodar Territory)



The piggery at one of the state farms of the Stavropol Territory in Northern Caucasus

In the Urals are found particularly pure iron ores, such as the Bakal ores which go to the Chelyabinsk Combine, and there are others to which Nature itself has added just that amount of chrome and nickel which is artificially added to steel to make it tougher, more flexible and stainless. This ore is made into metal at the Orsk-Khalilovo Combine in Novo-Troitsk.

At the Siberian end of the Urals-Kuznetsk Combine lies Stalinsk in the Kuzbas. In April 1932, three months after the first blast-furnace in Magnitogorsk went into operation, Stalinsk made its first steel.

The Urals-Kuznetsk Combine was an outstanding achievement in the planned economy of the Soviet Union: it greatly increased the industrial might of the country. The long haul of ore and coal justified itself. But, nevertheless, such long hauls are best avoided. Was it not possible to introduce some corrections?

The Soviet state had to set up the Urals-Kuznetsk Combine at a time when little coal was known to exist in the Urals, rich in ore, and when there was little iron ore available in the Kuzbas, rich in coal. It was necessary to combine the coal and the iron ore, though a long gap lay between them. A pendulum with a swing of thousands of kilometres had to be set in motion between them: at one end of the swing it deposited coal, at the other, ore.

But with the passage of time the contours of the Urals-Kuzbas have changed.

The Urals was helped by the coal of Karaganda, in Kazakhstan, which is only half the distance from the Urals than the Kuzbas. This coal merged with the stream of Kuznetsk coal and reduced its share. In addition to all this, large deposits of iron ore were discovered nearer to the Kuzbas—in the Gornaya Shoriya and near Abakan.

Then the task arose of reducing the transport of Urals ore to the Kuzbas. The metal industry of Stalinsk began to switch over to its own Siberian ore.

Thus sprang up the metal industry of the East. The metal industry of the South remains very significant both proportionately and in importance. Its works, destroyed during the war, were quickly re-

stored Its technological methods are of the highest order, completely modern.

Other metal industry centres have been established and are growing stronger as, for example, at Cherepovets, east of Leningrad Steel is also made at Komsomolsk, in the Far East Georgia makes metal at the new works in Rustavi, near Tbilisi Azerbaijan rolls tubes at the new works at Sumgait, near Baku Steel was being produced in Uzbekistan and Kazakhstan even before the war. It is made in the neighbourhood of the Kursk Magnetic Anomaly.

The establishment of a second metal industry base—the Urals-Kuznetsk Combine—was an outstanding achievement of the Soviet economic system. But in the same way that the first base proved to be insufficient, the second too does not meet the country's needs. The creation of a third base was placed on the agenda

The third metal industry base is being established under the Seven-Year Plan in Siberia Big iron ore deposits have been found there, mainly in the Angara region. They will feed new works, two of which are to be built during the Seven-Year Plan—one near Stalinsk in the Kuzbas, the other at Taishet, east of Krasnoyarsk. Their coke will come from the Kuzbas.

The metal combine which is at present being built in Karaganda to use local coke and ore is also connected with the third, Siberian metallurgical base.

Looking farther ahead, beyond the limits of the present Seven-Year Plan, the Soviet Union is planning a fourth metal industry base east of Lake Baikal. There, in the southern part of Yakutia, very rich deposits of iron ore and coking coal have been found, and it is important to note that they are adjacent to each other. The time will come when industrial centres of world significance will arise in the dense taiga of today.

* * *

Let us touch briefly on several other branches of industry.

An advanced non-ferrous metals industry has been founded in the U.S.S.R. during Soviet days. Large quantities of copper, zinc,

lead, tin, aluminium and rare metals are produced at first-class factories and combines

The chemical industry has been greatly expanded and its production now exceeds pre-Revolution production by more than a hundred-fold. It is of a highly varied nature—at new, modern, very large combines various acids, chemical fertilizers, synthetic rubber from a variety of raw materials, etc., are produced. At the present time great attention is being paid to the chemical industry in the U S S R: it will help to bring about a sharp rise in the production of those consumer goods which have various artificial and synthetic materials as their basis. In this connection intensive construction in the chemical industry is now in progress.

The timber industry is growing rapidly. The Soviet Union already leads the world in the output of timber. The area over which timber is felled annually in the U S S R is almost equivalent to the territory of Belgium, reforestation proceeds simultaneously. Lumber-jacking is mechanized. The conversion of timber into cellulose, paper, prefabricated houses, furniture, etc., is steadily increasing.

MACHINE-BUILDING

What was the main point of that all-embracing and all-absorbing process of the industrialization of the Soviet Union, which required the application of the entire energy of the people and, when achieved, not only transformed the appearance of the country but changed the relation of world forces? The point was that without a developed industry Russia could not have reinforced her new social structure. Without industry she could not have been the first country in the world to make the transition from a capitalist to a socialist way of life. To do that meant achieving complete economic independence in conditions of capitalist encirclement. And that could not have been done without industrial development.

In turn, an independent, self-sufficient industry would not be created without the possession of a native machine-building industry. In our days it is impossible to obtain coal and oil, to plough the land,

to move about the country without machinery. And if you do not want to buy machinery abroad, and thus be dependent on foreign lands, you must make it yourself. In other words, the creation of a native machine-building industry was of primary importance in socialist industrialization.

In tsarist Russia almost half of the machinery and factory equipment was imported. The building of a factory usually consisted of putting up the walls and installing machine-tools bought abroad.

The transformation of the Soviet Union from a machinery-importing land into a machinery-producing land—that was the task the Soviet state set itself. This task has been fulfilled.

The total industrial production of the U.S.S.R. in 1958, reckoned in volume, was thirty-six times greater than in 1913; the production of the machine-building and metal industries, however, rose to a level 240 times higher than that of 1913. That means that machine-building and metal-working grew much faster than industry as a whole. The Soviet machine-building industry has taken first place in Europe. And we must remember that forty years ago the country, as Lenin pointed out, was equipped with modern means of production only a quarter as well as Britain, a fifth as well as Germany, a tenth as well as the United States.

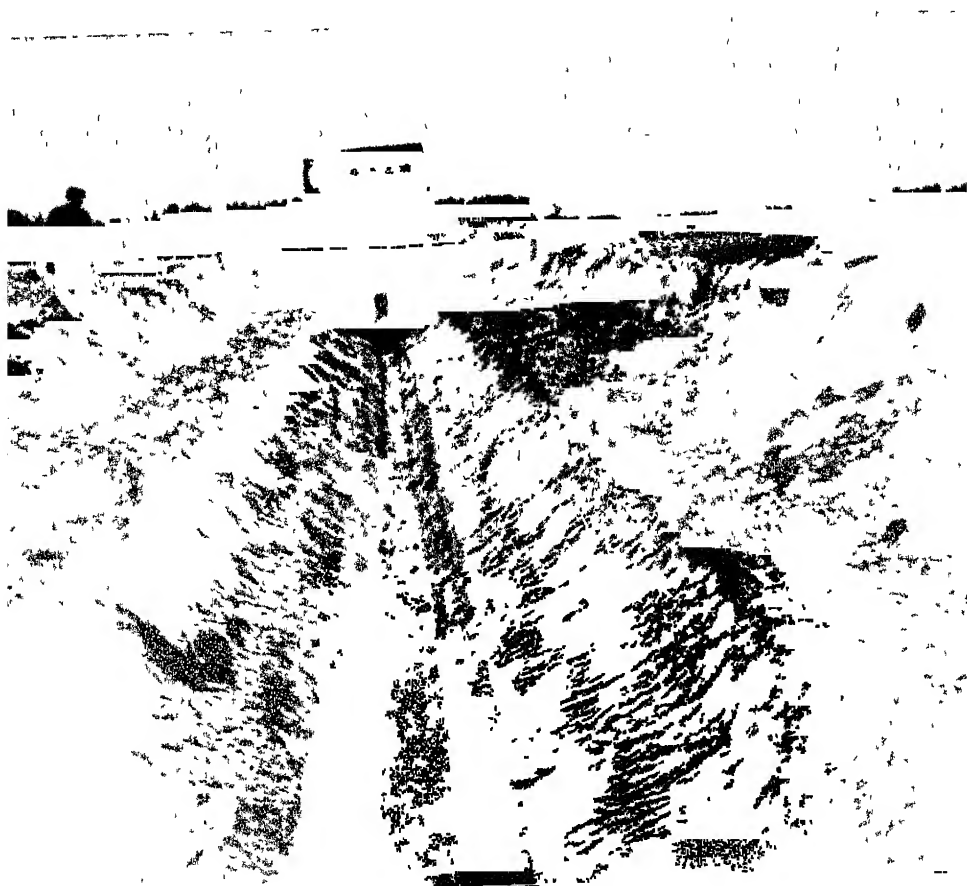
Today, in not one of the most highly developed lands, including the United States, does machine-building occupy such a large share in the national economy as it does in the Soviet Union.

The Soviet Union founded a highly developed machine-building industry which has become the guarantee of its economic independence.

The Soviet machine-building industry continues to expand rapidly. It is growing on a new technological basis. During 1959 alone over 2,000 new types of machines, mechanisms, apparatuses and other equipment of major importance have been designed and made ready for production. Soon the machine-building industry will enable the country to fulfil the highly important task of completing the mechanization of heavy and labour-consuming processes of work in industry and building, and of completing the mechanization of the main field work on the kolkhozes.



Mechanical tea-pluckers at work in Georgia



Reclamation of marshland in Latvia

The Soviet Union has learned not only to run machinery but to manufacture any type of machinery, including the most complicated. All branches of the Soviet economy are now equipped with the most up-to-date machines

In the coal-mines, for example, combines which remove the coal from the face and load it into trucks are used extensively. In the Soviet metal industry we see the most powerful blast-furnaces and open hearth furnaces, bloomings and slubbings. There are turbines and generators unique in size at electric power stations. Enormously powerful accelerators for particles have been built; the atomic ice-breaker *Lenin* has been built and launched. The gigantic Soviet jet passenger air liners are known to the whole world. On the great building sites we use walking excavators and floating dredgers that replace thousands of hands. For agriculture, complicated machines have been invented that harvest cotton, tea, maize and sugar-beet. First-rate radar equipment is made.

Automation is being introduced into production more extensively every year. This, indeed, is one of the most important aspects of technical progress in industry. Blast-furnaces and open hearth furnaces, for example, are almost entirely operated by remote control. Many rolling mills also "run themselves." Many hydroelectric power stations are automatized and run by remote control.

In the U.S.S.R., very large machine-building works have been built, including such giants as the Urals Heavy Machine-Building Works at Sverdlovsk, and the Novo-Kramatorsk Works in the Donbas. At these works various complicated machines for heavy industry and building are produced.

The machine-tool industry is an important branch of the Soviet machine-building industry. There are big machine-tool building works in Moscow and Leningrad, as well as in the Ukraine, the Urals, Siberia and other parts of the country. These works make the most varied assortment of machine tools, including complicated special machine tools and entire automatic lines.

In pre-Revolution Russia there were very few motor cars, and these were imported. In the Soviet Union an automobile industry has been

created. There are large automobile works in Moscow, Minsk, Gorky, Yaroslavl, in the Urals and elsewhere. There are big tractor works in Stalingrad, Kharkov, Chelyabinsk, etc.

Practically the entire machine-building industry of the country has been built in Soviet times. It has forged ahead, changing its distribution over the map of the country.

Before the Revolution the machine-building industry of Russia was limited to the central regions, the North-West, and to portions of the Ukraine. The East lagged behind as a part of the country not only without machine-building but without machines, either.

The growth of Soviet machine-building began in the central regions. In the First Five-Year Plan this was the only region where skilled workers and engineers were required.

The Krasny Putilovets (the former Putilov Works) in Leningrad learnt how to make tractors. The Moscow AMO Works not only repaired foreign cars, it began to manufacture its own. New diesel engines were produced at Sormovo near Gorky. The Kolomna Works near Moscow increased the power of the railway engines it produced.

And beside the old works, new factories were built during the first five-year plans. It took less than twelve months to erect on waste ground the first section of the Moscow Ball-Bearing Works. In eighteen months a large automobile factory was built in Gorky.

The old works too were transformed into new ones. The Leningrad Krasny Putilovets, for example, became the huge Kirov Works, it had little resemblance to what it had been.

In addition to the expansion of the old machine-building centres new ones were created. A major shift in the economic geography of the country gathered head: new machine-building works rose in former outlying and underdeveloped districts. The factories of Central Russia, which were adjusted to the production of intricate machinery, passed on their experience of mass production to the new and distant factories. And the country came to recognize the tractors of the Volga Basin and the Urals, the agricultural machines of the North

Caucasus and Central Asia, the machine tools and railway engines of Siberia

The factories were located rationally. The tractor works were built in the grain belt, and also close to the sources of metal—Kharkov, Stalingrad, Chelyabinsk. The works producing heavy machinery were established in the regions of the ferrous metals industry—in the Donbas and the Urals—where there were at the same time suppliers of metal and customers for the machines. The railway-carriage building works were located where both timber and metal were accessible, for instance, in Nizhny Tagil in the Urals. Factories producing machinery for the cotton fields were placed in Uzbekistan, the land of cotton.

The towns changed their appearance. The old trading and artisan city of Kharkov, for instance, became a city of qualified workers, engineers and scientists. Chelyabinsk in the Urals was transformed from a quiet provincial town into a major industrial centre. Rostov-on-Don took on an industrial look: its factory Rostselmash started to produce more agricultural machinery than the whole of tsarist Russia had done. Tashkent in Central Asia, which had no large industry at all, is now producing three-quarters of the Soviet Union's cotton-spinning machinery.

In the agricultural region of the Volga Basin, in the old Urals, in distant Siberia, a first-rate industry had arisen even before the Second World War; skilled workers had been trained, a new, industrial way of life was flourishing. Since then, however, big new advances have been made.

The Soviet machine-building industry is developing in every region, every republic. This is the most remarkable change in the country's economic geography, for it bears witness to the unprecedented way in which the people's industrial capacity has grown throughout the land.

Glance, for instance, at the distant Siberian rivers. At Tyumen on the Tura there are shipyards. At Omsk on the Irtysh agricultural machinery and radio components are manufactured. Novosibirsk on the Ob, with its machine tools and various sorts of machinery has

become one of the major industrial centres of the U S S R At Tomsk on a tributary of the Ob, ball-bearings are made Krasnoyarsk on the Yenisei makes very many different types of machinery.

It is in the interest of the Soviet Union that machine-building, the most highly developed branch of industry, should be located in all its republics and regions This policy is the direct opposite of the one pursued by the government of tsarist Russia Preserving the economic and political supremacy of the bourgeoisie of the Centre, the tsarist authorities did not permit manufacturing industries to be located in the outlying non-Russian parts But now advanced industries have grown up in these previously backward areas

The growth of the Soviet machine-building industry during the Seven-Year Plan is a decisive factor in the further development of the productivity of labour and will make possible a further reduction of the working day without loss of earnings The production of the machine-building and metal-working industries is being approximately doubled. Other branches of industry, such as heavy machine-building, machine-tool building, instrument-making, the electrical industry, the radio industry, will grow at a rapid pace The transition to complex mechanization and to automatically controlled production through the application of electronic devices is, as we know, the most characteristic feature of modern technical progress. That too will be a main trend in the construction of new machines during the Seven-Year Plan.

The machine-building industry will grow both on the basis of the construction of new factories, especially in the eastern part of the U S S R., and as a result of the reconstruction and improvement of existing ones

CONSUMER GOODS

The October Revolution put an end to the yoke of landlords and capitalists in Russia To everyone who worked it gave human rights But the Revolution's achievement was not limited to that It put

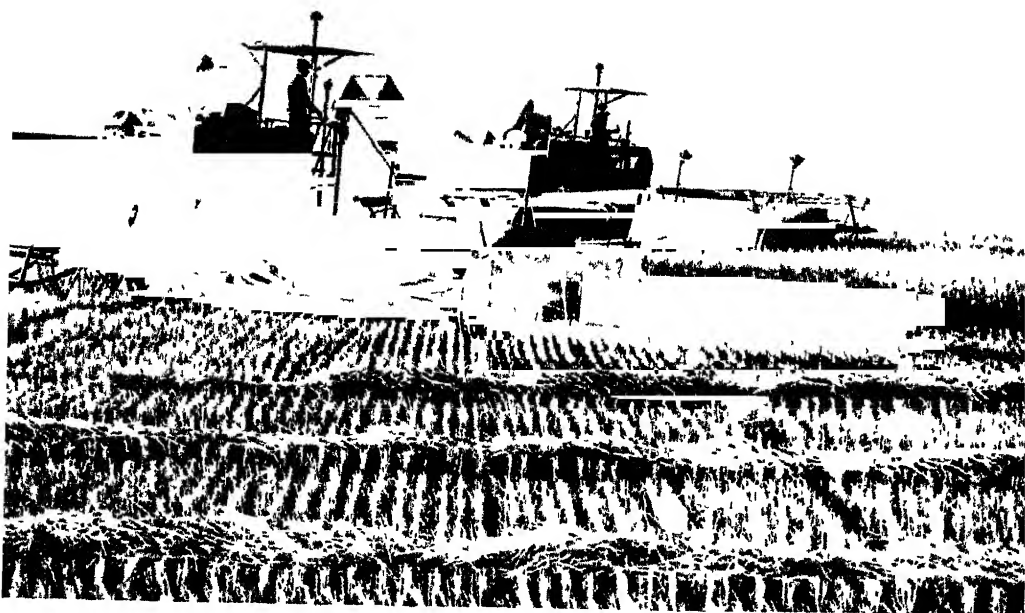
A wheat field in Siberia







A street in a state-farm settlement on virgin lands in Southern Kazakhstan



Harvesting grain on recently cultivated virgin
steppe in Siberia

the people on the road to a constant improvement of their living standards

The main economic law of socialism envisages the possibility of a fuller satisfaction of the constantly growing requirements of the people by the continuous growth and perfection of socialist production.

The level of the people's requirements is continually rising in the Soviet Union. It has been rising specially fast in recent years on the basis of the expansion of heavy industry and the successes achieved in agriculture

The Seven-Year Plan envisages further rapid progress in this respect. The output of manufactured goods, foodstuffs, and articles of everyday life will increase rapidly. The plan will enable the country to make a substantial advance towards the solution of the problem of fully meeting the constantly growing material and cultural requirements of the Soviet people. The plan envisages that the population's requirements in textiles, clothes, footwear and other goods will be amply met

It is clear that only by expanding and equipping the light and food-processing industries can the population be provided with a constantly increasing supply of consumer goods

The growth of heavy industry made it possible to expand the light and food industries as well, and to equip them with new machinery. The old enterprises have been radically rebuilt, enlarged and improved. Many new factories have been opened.

The chief branch of the light industry—the textiles industry—has grown substantially in Soviet times. The footwear industry has been, in the main, re-equipped—the Leningrad factory Skorokhod alone gave the country before the war three times more boots and shoes than all the factories of pre-Revolution Russia combined. The garment industry may be considered an entirely new one. So may the artificial-silk industry. New machines were installed in the combines and factories of light industry. During the Seven-Year Plan light industry will develop fast. Its output will increase by about 50 per cent. The quality and variety of cloth, clothes and footwear will continue to

improve. In addition to natural raw materials a large amount of artificial and synthetic material will be used. By the end of the Seven-Year Plan, the U S S R will be drawing close to the U S A in the production of cloth, clothes and footwear, both in gross output and in per capita production

The output of goods required in everyday life, as of machines and appliances which reduce housework, will be doubled. There is to be a substantial increase in the production of furniture, sewing-machines, refrigerators, washing machines and dish-washing machines, radio sets, radiogramophones and television sets, watches, bicycles, motor cycles and motor scooters, cameras and electrical domestic appliances

The Soviet food industry has long since surpassed, in price values, the entire industrial output of tsarist Russia, including the pits of the Donbas, the Baku oilfields, the textile mills of Moscow and the metal works of St. Petersburg. Within the country nearly one hundred different varieties of agricultural produce are grown for the food industry. During the Seven-Year Plan the production of the food industry is to increase by approximately 70 per cent.

In pre-Revolution Russia there were sugar refineries, steam mills and tobacco factories, but it was not they that were typical of the food industry, it was the windmills, primitive butter churns, small distilleries, village hulling mills, and slaughter-houses in wooden sheds. In our days the food-processing industry means huge mills and meat combines, canning factories, automatic bakeries, fully re-equipped sugar refineries, new oil-extracting establishments, salt-mines where the entire process is mechanized, ocean-going refrigerator ships. The fishing vessels of today are big, powerful ships which no longer hug the coast but go after shoals far out to sea—right out into the North Atlantic.

In per capita production of a number of important foodstuffs, the U.S.S.R. will during the Seven-Year Plan catch up and outstrip the most highly developed capitalist lands.

An enormous increase in the manufacture of consumer goods has been provided for. This cannot be achieved without very extensive

new construction. Never before has the Soviet Union known so much new building in the light and food-processing industries. New factories are numbered in hundreds. Building is going on all over the country

The Seven-Year Plan envisages the construction of more than 150 large new light industry enterprises. During that period, too, 114 enterprises on which work was started earlier will be completed. In addition, about 250 new meat-processing enterprises, over 1,000 enterprises for processing milk and over 200 canning factories will be commissioned. The capacity of sugar refineries will be more than doubled

The cotton industry is spreading to various parts of the country. In Transcaucasia and Central Asia—that is, in the lands of the cotton growing—it appeared only in Soviet days. New gigantic combines are at present under construction in Kamyshin, Engels, Krasnodar, Kherson, Stalinabad and Barnaul. The textiles map is changing beyond all recognition.

Work at the new combines is mechanized. Each combine is an entire town with spinning-machines, looms, finishing and various auxiliary shops, tall apartment houses, a Palace of Culture, a hospital and schools.

The biggest of these new textile centres is at Kamyshin on the Volga. No other textile mill in the world can compare with it, it covers as much ground as the town itself. Its daily capacity will be almost one million metres of cottons, sateens, cambrics, voiles, plaids, flannels, stockinets, taffetas and velveteens enough to clothe over 200,000 people. Part of the Kamyshin Combine is already producing.

Before the Revolution nearly one half of Russia's production of wool fibre was exported, most of the Russian mills were in the central region. In our days the mills of this region have been expanded but at the same time new mills have been built in many parts of the country, taking in the regions where the raw materials are available. And many new wool mills are now being built. Among them are big worsted centres at Minsk, Chernigov and Sverdlovsk.

The silk industry also depended on imported raw materials and gravitated towards Central Russia. Now, in the U.S.S.R., there are more silk mills in the regions where raw silk is produced, mainly in the towns of Transcaucasia and Central Asia.

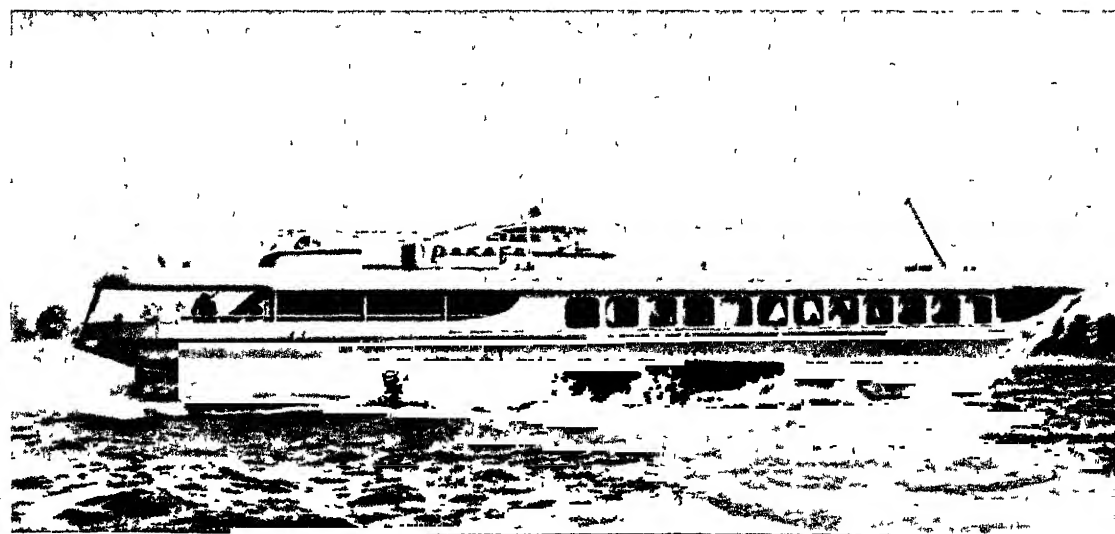
Tsarist Russia grew her own flax but sent it abroad and her linen industry remained weak. It was concentrated mainly in what is now the Ivanovo Region, although long-fibre flax was grown somewhat farther to the west. Now mills have been and are being built right along the flax belt from Byelorussia to the Urals.

In tsarist days the food industry enterprises, whether big or small, were huddled together in large towns or were scattered about the country in isolated clusters; the sugar refineries were in the Ukrainian wooded steppe, the creameries in the Kuban, the fisheries on the northern Caspian, flour milling near the Volga wharves, dairy-farming in Western Siberia and near Vologda in the European North. Now the food industry is distributed more evenly—in accordance with natural and economic conditions. The flour milling has moved into Siberia, to the new areas of grain sowing; sugar refining is now located deep in Central Asia and the Far East; the Pacific seas and Murmansk area fisheries have surpassed the Caspian in production, dairy-farming has ceased to be the monopoly of Western Siberia and the European North.

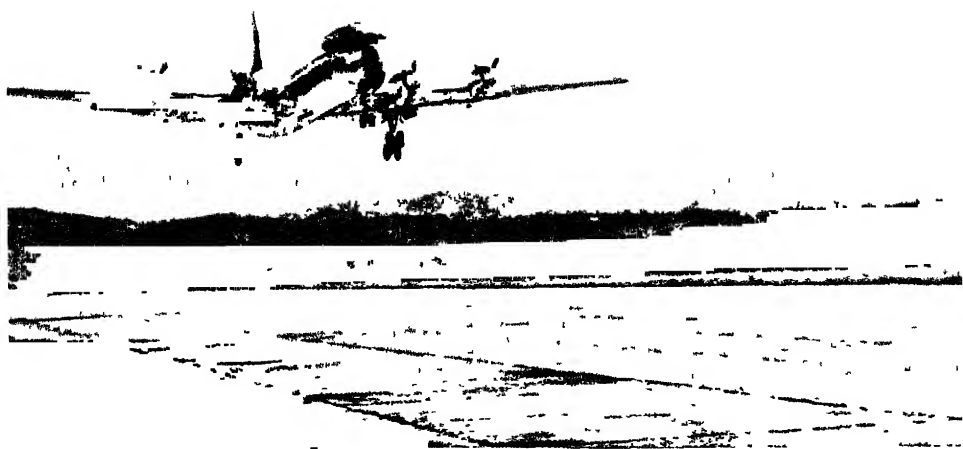
The map of the food industry is changing profoundly as the result of the vast construction programme now being unfolded throughout the country. Everywhere are being erected meat combines, dairies and milk-products factories, refrigerators, canning factories, and bakeries.

Many of the new constructions are very large. An enormous fats combine at Saratov occupies 26 hectares. Twenty-five railway trucks are needed to ship the daily production of the Izmail Canning Factory. At the Gorky Meat Combine, one automatic machine turns out five tons of meat-dumplings in twenty-four hours.

The production of foodstuffs in the Soviet Union today is the most evenly distributed branch of industry.



The high-speed motor vessel **Raketa** ("The Rocket") fitted with hydro-foils on the Volga



Civil airliner IL-18 over Adler airfield in the
Caucasus

The locating of the light and food-processing industries throughout the country leads to a fuller satisfaction of the people's requirements for good clothes and footwear, for nourishing and tasty food, for comfortable and attractive goods for everyday use

ADVANCE IN AGRICULTURE

Tsarist Russia, as we have seen, had some industry, but the main economic activity of the country was agriculture

Agriculture itself was extremely backward. An overwhelming majority of the population were peasants.

Two-thirds of all farm land belonged to landlords, kulaks, the monasteries and the imperial family. The rest—the poorer land—was parcelled out among many millions of poor and middle peasant households. The peasants' back-breaking work in the fields brought them a meagre return.

The peasants used primitive ploughs, wooden-toothed harrows. They sowed by hand from bast baskets. They threshed with hand-flails. Animal manure was the only fertilizer they knew. They were ignorant of the right crop-rotation methods.

The peasants took small crops from the insufficiently fertilized shallow-ploughed soil. Nor did the landlords' fields do much better: the landlords rented out their land and based their economy mainly on the same peasant labour, the same medieval methods and implements.

Only in a few parts, such as the sugar-beet regions of the Ukraine, did landlord farming attain a relatively high standard; the newly developed parts of south Russia produced much grain, for there the farms were equipped with a certain amount of machinery. Over the rest of the country agriculture was carried on with antediluvian methods. And in the Asian parts of Russia great expanses of land were given up to cattle-breeding by backward, nomadic methods.

The heavy yoke of the landlords and the kulaks (rich peasants), the shortage of arable land, the backwardness in machinery and farm

implements, the low yields—all this led to the impoverishment of the people in Russia, to constantly recurring famines

The October Revolution put an end to private ownership of land. Today you will not find the deep ditches which used to run along the border of each estate, you will not see the boundary posts bearing the name of the landowner. In the U.S.S.R. the land belongs to the state.

The Soviet state turned over to the peasants more than 150 million hectares of former landlord, monastery and crown lands, in addition to the land the peasants had previously owned. That saved the peasantry from landlord bondage, and struck a decisive blow at the shortage of arable land, from which the Russian people had suffered from time immemorial.

First to disappear were the private boundary posts; then the narrow land strips went. During the first years after the Revolution the peasantry cultivated their plots by themselves, but this small-scale economy hindered the use of tractors and other machines on the land and the peasants were unable to increase crop yields to serious extent. The shortage of grain and agricultural raw materials was a brake on the growth of industry and of the entire national economy.

Then the state and the Communist Party appealed to the peasants to collectivize. The Soviet authorities sent tractors, fertilizers and agronomists to the villages. Tens of thousands of workers, envoys of the towns, helped the poor and middle peasants to combine in co-operatives. On the experience of the first collective farms (kolkhozes) the peasantry convinced itself of the superiority of collective agriculture. Millions of land workers joined the kolkhozes.

At the present time, the vast stretches of cultivated land, which now constitute the main feature of the countryside, are concentrated in the hands of kolkhozes and big state farms. In 1959 there were about 70,000 kolkhozes and 6,000 state farms (sovkhozes) in the U.S.S.R.

With the assistance of the state, agriculture has equipped itself with up-to-date machines and implements. In 1959 1,700,000 trac-

tors, 500,000 harvester combines, 700,000 trucks and many other machines of every description are working in the fields of the Soviet Union. They were all built at Soviet factories.

When at harvest time a column of combines streams across the boundless sea of the Ukrainian or Kuban wheat fields, one can see with one's own eyes that agricultural work in the Soviet Union is becoming an industrial process.

In the capable hands of the famous Soviet combine driver Konstantin Borin a single unit has replaced 950 men, 150 horses, 37 winnowing-machines, 20 horse-drawn threshing-machines.

In the Soviet Union today the ploughing, the sowing of grain, cotton, sugar-beet and several other crops have been practically fully mechanized. The harvesting of grain crops (not including maize) has been almost completely mechanized.

The modern Soviet village bears little or no resemblance to the pre-Revolution village. Its appearance has changed beyond recognition, in the fields machinery has become the decisive force in agriculture, the crops are far higher, peasant incomes have increased many times over.

But the country has advanced rapidly and the requirements of the Soviet people have risen. For all its growth, agriculture was not yet fully meeting the demands made on it.

A few years ago broad measures aimed at raising agricultural production were put into practice.

Urgent steps were taken to increase the number of machines available. Many specialists were sent from the towns to work in the villages. Increased material incentives to raise production were offered the kolkhozes and their members.

These measures bore fruit rapidly. Agricultural production rose quickly.

Further rapid advances in agriculture will go on during the Seven-Year Plan. The target has been set to achieve so large an expansion of agricultural production that it will be possible to provide food in abundance to the population. This target is being fulfilled.

The extension of the mechanization and electrification of agricul-

tural production will continue, and collective and state farms will go on being equipped with advanced machinery. During the Seven-Year Plan it is intended to produce over a million tractors for agriculture, about 400,000 harvester combines and many other machines.

WHEAT

The leading role in Soviet agriculture is played by grain. For all the development of stock-breeding and the growing of industrial crops, the production of grain is the main aim of Soviet agriculture. The Soviet Union is one of the world's major grain producers. And the first place among Soviet grain crops is held by wheat.

Much rye, oats and barley is sown too. In terms of sowing area the U.S.S.R. leads the world in these crops. Maize and millet are also grown in large quantities. But wheat occupies a special place. No other country in the world sows as much wheat as the Soviet Union.

It should be noted that the wheat grown in the Soviet Union is of high grade. This is to be attributed to the fact that as a result of the continental climate Soviet wheat contains a high proportion of albumen.

The main wheat region in the U.S.S.R. coincides with the belt of chernozem steppe and wooded steppe. It stretches in a constantly narrowing belt from west to east—through the Ukraine, the Don, the Kuban, the Middle Volga Basin, the Southern Urals, Northern Kazakhstan, Western Siberia. This is the country's main granary.

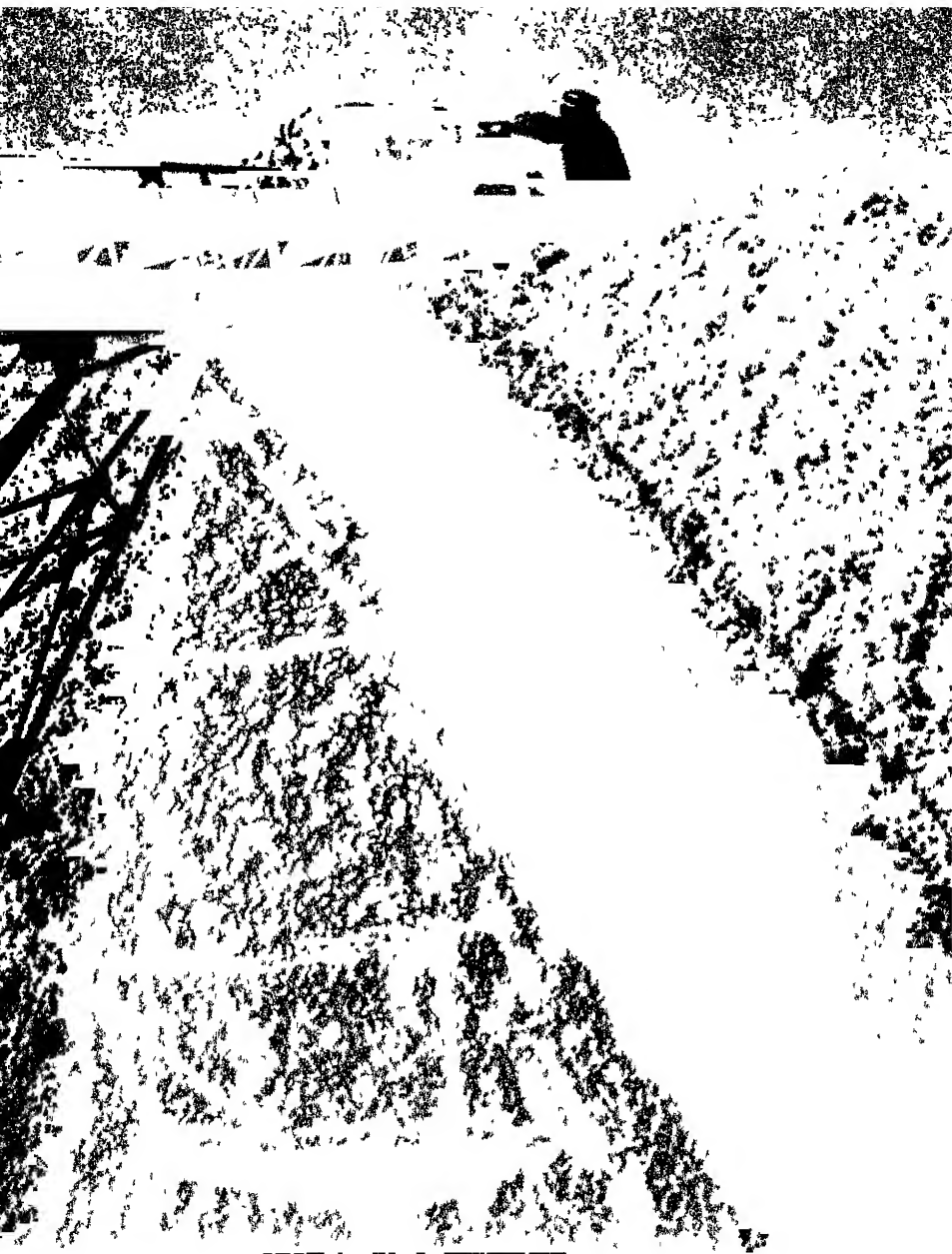
Grain production has risen steeply in Soviet times but until recently the level was insufficient to satisfy fully the extraordinarily rapid growth in demand. In particular there was a lag in the production of grain-fodder crops.

Recently special measures were taken to develop grain production rapidly.

The principal way of increasing the grain harvest is to raise the yield everywhere. Much has been done in this direction. But another

Aurochs in the Byelorussian preserve "Belovezhskaya Pushcha"





Cotton brought in Uzbekistan

method of raising grain production was found, a way of raising it in a very short time

The steppe belt which stretches thousands of kilometres across the Soviet Union had been almost completely ploughed up in the European part of the country, that is, west of the Urals, in densely populated places. But east of the Urals there remained until recently a big area consisting either of unutilized chernozem and chestnut soils or of virgin and long-fallow soils. In that area—Siberia and Northern Kazakhstan—the population is less numerous. And although the local inhabitants were constantly increasing the sown area, they found it impossible to exploit fully the entire territory. In Northern Kazakhstan, for example, about one half of the cultivable land remained virgin at the beginning of the Second World War.

It was this unutilized though fertile land in the East that it was decided to plough and sow to wheat in a short period of time.

To fulfil this enormous task two main things had to be done: first, hundreds of thousands of workers had to be found, and, secondly, they had to be provided with tractors.

A gigantic number of tractors was required—over 200,000, not to mention other machines. The Soviet machine-building industry coped successfully with this great task.

But how was the country to tackle the manpower question? After all, there are no idle hands in the Soviet Union, there being no unemployment. The problem was solved in an original way, typical of the relations that exist in the U S S R between the people and the state. The Government and the Communist Party appealed to the youth to go voluntarily to the East and work there so that the country could get the abundance of grain that it needed so much. This appeal did not fall on deaf ears: over 350,000 young men and women, in all parts of the country, from its towns and cities, from its factories and offices, set out for the land east of the Urals, built new settlements there, sat at the wheel of tractors and, working with enthusiasm, literally created a new wheat granary in a short time. Here is an idea of the scale of their work. In three years 36,000,000 hectares of land in the eastern parts of the U S S R have been

ploughed and cultivated What can we compare this figure with? Suffice it to say that the area of new-ploughed land exceeds that of all the cultivated land in West Germany, France and Britain combined

The country obtains big harvests from the new territories year after year The gross grain harvest of the U S S R was never as big as it is now Between 1953 and 1958 procurement of grain rose by 1,600 million poods The country does not suffer from any grain shortage The decisive battle has been fought in the campaign to increase grain production

During the Seven-Year Plan grain production will continue to increase By the end of the period the Soviet Union will be harvesting 10,000 to 11,000 million poods of grain a year compared to 8,500 million poods in 1958

The crucial wheat-growing area in the Soviet Union is the chernozem steppe But in Soviet times another wheat-growing zone has been developed It is of less importance than the chernozem steppe but it is interesting because its development is almost entirely new

We are referring to the extension of wheat to the more northerly non-chernozem belt where such cities as Moscow and Leningrad lie

At one time, before the growth of capitalism in Russia, before the rapid rise of large cities, the non-chernozem belt had its own grain Later, grain production declined in the face of competition from the new southern agricultural districts where the treeless chernozem expanses were quickly cultivated This grain from the south poured on to the market and was sold at a cheaper price than the northern-grown grain The small-holding peasantry of the non-chernozem districts, harassed by land hunger, could not survive in competition with the capitalists of the steppe. They lacked the means to clear the land of trees, drain the marshes and raise the fertility of the soil Millions of hectares of land suitable for cultivation lay under juniper and alder, under hummocks and tree stumps The impoverished peasantry abandoned the villages and went in search of work in the seasonal industries The north became dependent on the south

The little grain that was sown before the Revolution in the non-chernozem belt was coarse—barley, oats, rye

Grain growing is perfectly feasible in the non-chernozem belt, but the opportunities of doing so before the Revolution were wasted. Wheat could be found only here and there on rich peasants' or landlord's fields

In Soviet times it was decided to extend wheat growing northwards, and as the years passed the quantity sown there increased steadily

After the forests had been cleared and the scrub removed new areas of cultivated land appeared

Science came to the assistance of the collective farms by selecting suitable varieties of seed for the north

Before the Revolution only 250,000 ha were sown to wheat in European Russia north of the Kiev-Tula-Nizhny Novgorod line. On the eve of the Second World War this had increased to 3,000,000 ha. While much land in the non-chernozem belt is now being used for flax, vegetables, potatoes and milk cattle, the amount of grain grown is not inconsiderable. And a large proportion of it is wheat

The northern frontier of the wheat lands has been pushed up to and beyond the 60th parallel. The non-chernozem belt of the European part of the U S S R now yields almost half as much wheat as Canada.

A substantial amount of grain and flour is imported by the north from the south, but the north now eats white bread made from its own wheat. One of the tasks of the Seven-Year Plan is to make the villages of the non-chernozem regions of the U S S R fully self-supporting in locally-grown grain

INDUSTRIAL CROPS

Industrial crops, which serve as raw materials for industry, play an important role in Soviet agriculture. The country's boundless fields raise cotton, flax and sugar-beet, and the proportion of these and other industrial crops in agriculture has risen steeply in Soviet times

For example, the Russian textiles industry before the Revolution had to import half the raw cotton it needed. Now the greatly expanded textiles industry of the Soviet Union has fully adequate supplies from domestic sources and a part of the Soviet cotton crop is exported.

The Soviet Union's cotton crop is more than six times bigger than that of tsarist Russia. The Soviet Union produces more cotton than such well-known cotton-growing lands as India, Pakistan and the Egyptian part of the U A R combined.

The cotton plant requires much warmth and grows in the south of the country, mainly in Central Asia and Transcaucasia, on artificially-irrigated land. Uzbekistan is the Soviet Union's main source of raw cotton.

Important changes have been introduced into the techniques of cotton growing. Primitive methods of irrigation have been replaced by modern methods as we shall see in detail below. The ploughing, sowing and cultivation processes have been completely mechanized. Cotton-picking machines have been built and introduced into some of the cotton fields. Cotton-picking is the most labour-consuming process of work in cotton growing.

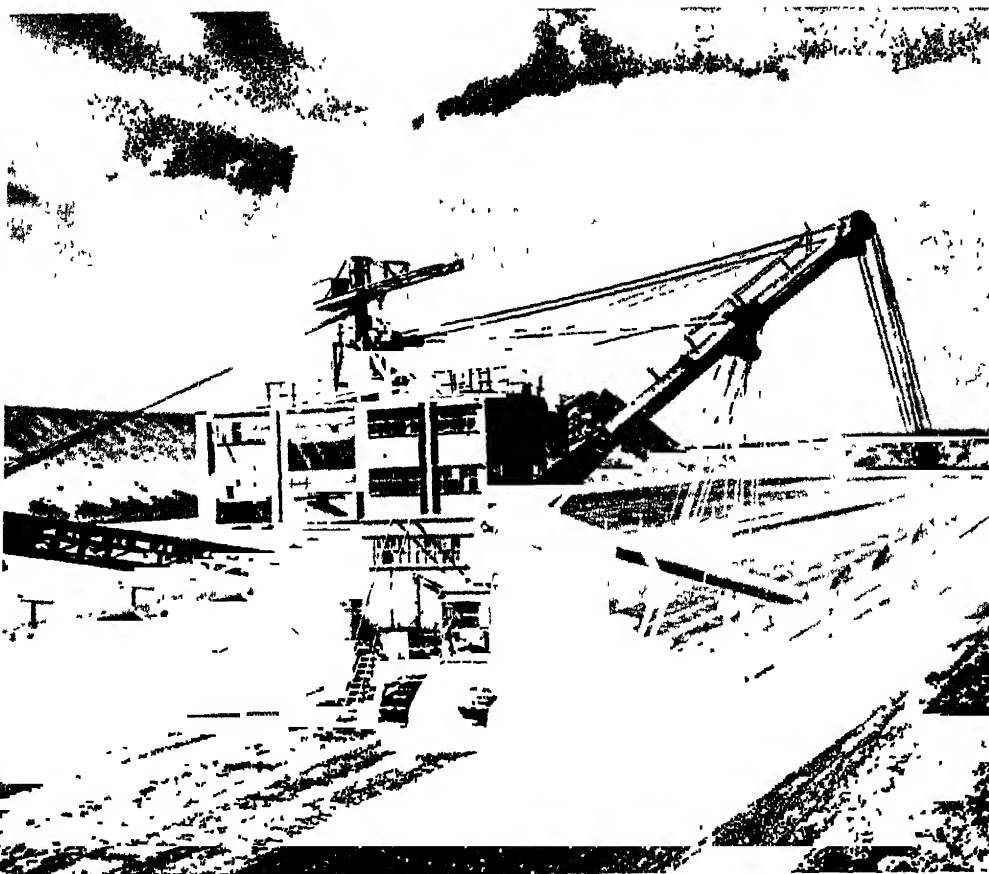
The following fact speaks for the advance in cotton growing. Before the Revolution the average crop of raw cotton in Central Asia was 6-7 centners a hectare. In 1958, however, it reached 27 centners in the Central Asian republic of Tajikistan. In no other country in the world is so high an average crop known. By 1965 the cotton crop will have increased by 30-40 per cent.

The fibrous flax plant, in contrast to cotton, needs a cool, humid summer with long hours of daylight. Flax is grown mainly in the north-western districts of the Soviet Union. In sowing area the Soviet Union is the world's leading flax grower. The flax fields are worked by machines. During the Seven-Year Plan the flax crop is to be increased by 31 per cent.

Sugar in the Soviet Union is produced from the tubers of the sugar-beet. The cultivation of this crop is also highly mechanized.

A power station on the Oka River, a tributary of the Volga, built jointly by several collective farms





Mining iron ore at the Kamysh-Burunsky mine in the Crimea

It has increased greatly in Soviet times. During the Seven-Year Plan the sugar-beet crop is to increase by 40-55 per cent.

Interesting changes have taken place in the distribution of sugar-beet planting. They can serve as an example of the way the agricultural map of the U.S.S.R. is being rationalized.

The sugar-beet frontiers in tsarist Russia were restricted artificially. The location of the sugar industry and thus the cultivation of sugar-beet were limited to the borders of the Ukraine and the Kursk Region. The intention was to make all Russia dependent on one region: this suited the men who ran the sugar market—their profits increased. The Ukrainian sugar-refinery monopolists succeeded in stifling all attempts to produce sugar in the Volga Basin, Central Asia and Siberia. The cost of transporting sugar to the east was higher than the cost of the sugar itself.

Now the sugar-beet has burst through the frontier that confined it in the cramped regions of the old sugar-beet zone, it has spread far to the south, east and north.

In the south the sugar-beet has reached Transcaucasia. There the soil is just as suitable for this crop as in the Ukraine. Sugar-beet is also grown in the Siberian steppes, and now in Central Asia, too, where on irrigated land a new world record in the yield has been set. Sugar refining has started in the new regions. In Kirghizia, for instance, more sugar is produced per capita than in France, Italy or West Germany. However, the largest share of the Soviet Union's beet and sugar still comes from the Ukraine and the Kursk Region.

In pre-Revolution Russia, with its unplanned economy it was not possible to introduce a correct and scientific system of specialization by regions, which means producing in each region the product for which local conditions are most favourable. But in the U.S.S.R., where the economy is developed according to plan, conditions exist for the deliberate scientific specialization of the agricultural regions. In each region that crop is sown which most corresponds to the economy of the region and to its natural conditions. This, however, does not mean that each field has only one crop assigned to it. Specialization in agriculture is not the same as cultivating a single

crop and thus exhausting the soil. Other plants are alternated in the crop-rotation with the main crop. The correct alternation of crops preserves and increases the fertility of the soil.

In the Soviet Union there have been important changes not only in the cultivation of those crops which were grown there before the Revolution. After 1917 a gigantic task was undertaken to revive and extend the range of crops. This was the result of the demands of new industry and of the growing requirements of the population.

New plants that the country stood in need of were transferred to the Soviet Union. Patiently the cereals, flowers and fruits of America, Africa, Australia and Asia were transplanted.

Very many new crops have been added to Soviet agriculture. A part of these have already been planted by the state and collective farms, a part are still being tested. In the quantity of crops raised the Soviet Union leads the world. Here are some of the plants which were not previously cultivated in the country.

In the arid areas sorghum is grown—it is sometimes known as the “camel of plant life.” It was introduced from Palestine.

Large areas of the Ukraine, Northern Caucasus and the Far East are sown to soya, a plant of Chinese origin, rich in albumen and oil.

In Central Asia and the Northern Caucasus, the South Asian plant, kenaf, a substitute for jute, has been introduced. Kenaf sacking protects sugar from spoiling without leaving any threads in the sugar.

The fibre of the jute can be used for the winding of cables. This plant, a novelty in the Soviet Union, has been introduced into the Ukraine and the Northern Caucasus.

Chumiza, a Chinese plant, is cultivated in the Soviet Union for grain, green fodder or hay.

From the ground nut, a native of Brazil, a valuable oil is extracted.

Chufa, a plant from the Mediterranean, gives the confectionary industry oil and flour. The southern hemp goes into the manufacture of rope. The teasels of a South-European plant, are used in cloth-making. All these are new crops for the U.S.S.R.

New crops mean new raw materials, new branches of industry, new assistance in satisfying the increasing demands of the people.

SUBTROPICAL AGRICULTURE

Tsarist Russia spent 200,000,000 rubles a year on importing subtropical raw materials. Practically no subtropical plants were grown in Russia

Among the new crops of the Soviet Union many are subtropical True, the country's share of the subtropics is a small one It falls only into the edge of the subtropical zone, and, moreover, from the northern, that is, the cold side Nevertheless the U S S R has its subtropics Here are some of the new crops of the Soviet subtropics.

One half of the fruit of the Chinese tung-tree consists of oil From this is obtained a lacquer which protects metal from rust Tung was unknown in old Russia. Now thousands of hectares in Transcaucasia are under tung

The Mediterranean cork-oak was a rare tree in pre-Revolution Russia Cork is needed not only for bottles, it is an essential component of the modern electrical and refrigerator industries Russia used to be dependent for it on the foreign market At the present time there are entire groves of cork-oak on the shores of the Black Sea They were planted twenty years ago and their bark is already being used

The cultivation of essential oils in tsarist Russia was insignificant Now a score of plants producing essential oils are cultivated for the Soviet scent industry, including the Kazanlyk rose, mint, coriander, iris, anise and geranium

India provides nearly the whole world with jute Ninety-five per cent of the world's entire area under jute is concentrated in India At first, as we have mentioned above, the Soviet Union learned to make sacks out of kenaf But later it began to grow its own jute Moreover, the fibre of Soviet jute is stronger than that of the imported commodity

In the subtropical oases of Soviet Central Asia Indian jute in places reaches a height three times that of a man Several jute factories have already been built Special machinery has been designed for processing jute

All the lemons available in tsarist Russia were bought in Sicily, all the oranges in Palestine, the olives in France, the figs in Turkey. The Soviet Union still imports fruit but only to supplement its own production.

In Western Georgia plantations have been established in places that used to be malarial swamps and wild undergrowth. And these plantations are already providing more subtropical fruit than used to be imported from abroad.

The subtropical crops are increasing. Recently in Georgia the collective farmer Khristo Neanidi gathered some 5,000 tangerines from each tree.

Tea used to come to Russia by sea from Ceylon, by camel caravan across the Gobi Desert from China. Around Batumi in Georgia less than a thousand hectares was planted to tea. Now tea is cultivated extensively in Georgia where dozens of excellently equipped tea factories are working.

Foreigners used to like to call Russia the "Northern Bear." And now this northern land has advanced into the select company of the states that cure the leaves of the tea plant—a plant of the extreme south.

Tea plantations require much manual labour, more than any other branch of agriculture in the subtropical zone. One might think that it was impossible to get along without the help of human hands, especially when it comes to plucking the leaves. Before the leaf is selected and plucked it has to be fingered. Is it ripe? But the tea gardens cover so extensive an area of Georgia today that it became absolutely essential to invent a tea-plucking machine. And the designers did not fail: they invented a machine with the sensitivity of human fingers. Now this machine is being used in Soviet tea gardens.

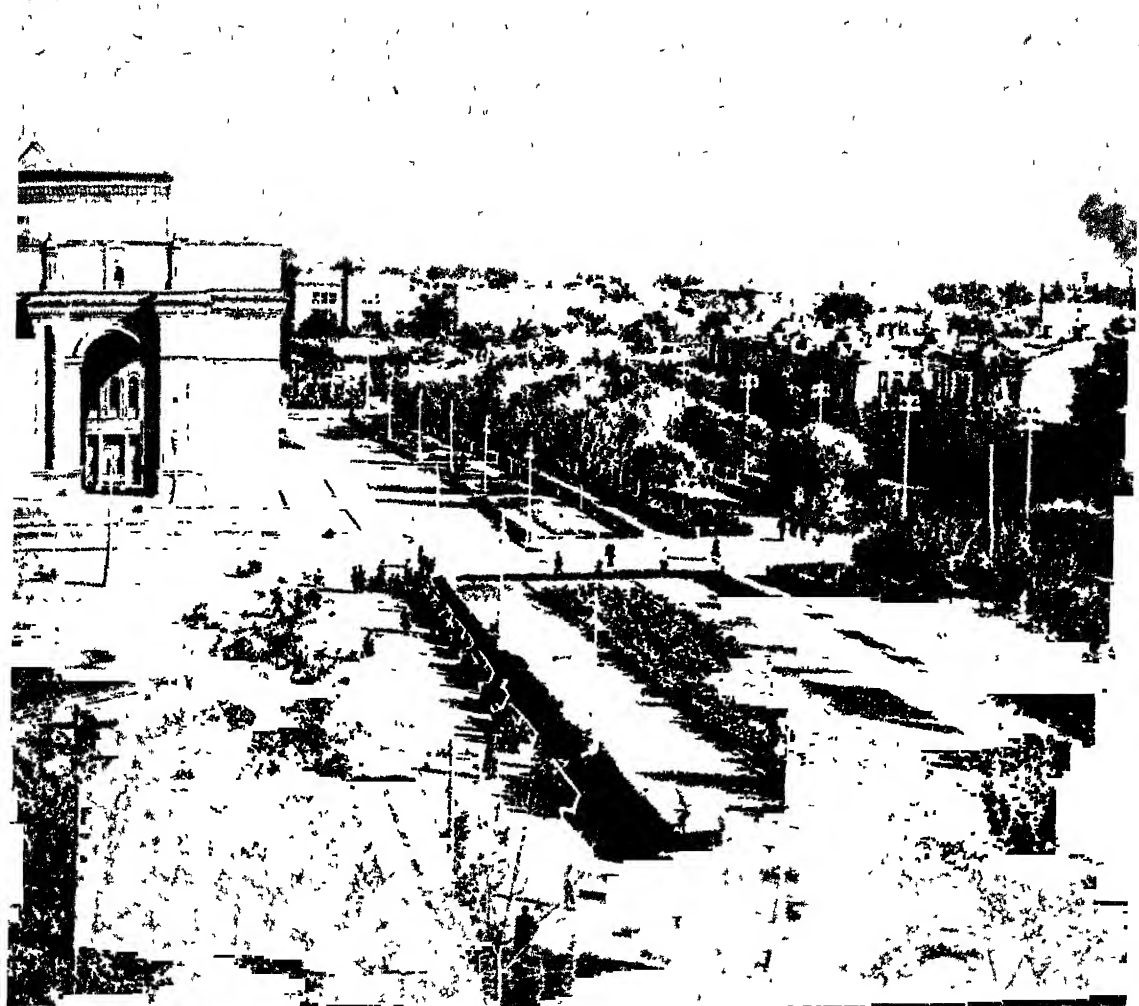
Grape-fruit, the sugary tart persimmon, the sweet and sour medlar, the delicious strawberry-scented fei hoa rich in vitamins and iodine—all these grow in the Soviet Union nowadays, although not very extensively.

Sugar-cane is sown in the valleys of southern Uzbekistan and Tajikistan. This tropical crop is difficult to raise in the Soviet Union,

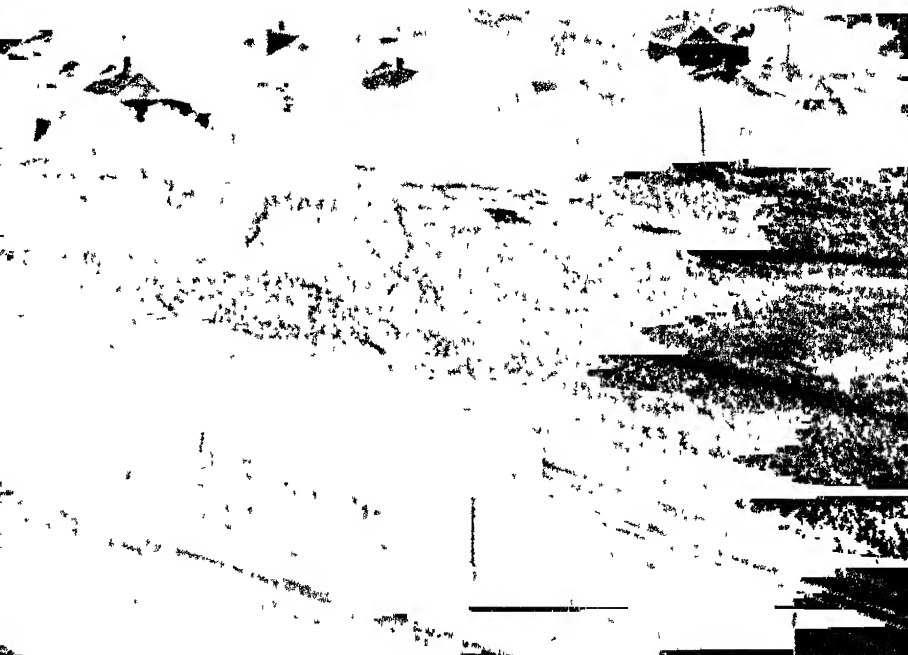


Kreshchatik, the main street of Kiev, capital of the Ukraine





The opera and ballet theatre at
Tashkent, capital of Uzbekistan



A mining settlement in the Donbas

at the northern border of the subtropics where the air is drier, the winter more severe and the warm season shorter than in the tropics. In the lands where cane sugar originates the annual rainfall reaches 5,000 mm, while here not a drop of rain falls the whole summer and artificial watering has to be resorted to. However, the climatic differences have been overcome by selecting early-ripening varieties, by feeding up the plants, and by crossing the wild Central Asian sugar-cane with the alien strain. Uzbekistan now has its rum distillery. The molasses is provided by sugar-cane which never grew in those parts before and, indeed, was considered ungrowable there.

The olive has been cultivated on the Mediterranean coasts since the days of antiquity. Thousands of years ago the silvery olive branch was a symbol of peace, long life and glory. But in southern Russia only small olive groves used to be found. However, the Soviet Union has its own dry subtropical regions. Olive plantations have been laid out in the Crimea. A state olive farm has been established in southern Turkmenia where there is also a factory for processing the olives. On the Apsheron Peninsula near Baku more and more olive-trees are planted every year, soon there will be thousands of hectares of them. Before long the country will receive a substantial quantity of its own olive oil, plump olives, and articles made of olive wood.

All that, of course, has involved a great effort.

In the humid subtropics on the coast of the Black and Caspian seas the flat ground was covered with bogs and swamps, and the slopes of the mountains with impenetrable forests. The swamps have been reclaimed, the trees uprooted. But the removal of the forests let in the wind, and so protective belts of trees have been planted at the edges of the fields.

The heavy rains created a danger of erosion on the slopes. With the assistance of tractors and graders, terraces were cut out on the mountain sides, forming long, narrow fields in steps.

If a plant pollinates itself badly it is pollinated artificially. If a plant finds the soil not quite satisfactory, chemicals are added to

change the nature of the soil. If a plant has too much light, steps are taken to shade it.

But the most difficult task of all is to protect plants from frost.

In the Soviet subtropics frosts are uncommon, but sometimes the mercury does drop below freezing point. A stream of cold air breaks through and, if only for a short spell, the thermometer records -5 , -7 even -10°C and the tender shoots of the southern plants are nipped. To save the sensitive plants, their stems are earthed up in winter. Sometimes the plants have to be muffled. A plantation of young lemon-trees in cold weather is a strange sight—each has its little white gauze cap. Sometimes special heaters are used, electric warmers being adjusted below the crowns of the trees.

However, the principal method of approach to the task of tapping the rich natural resources of the subtropics is the breeding of new varieties.

The people who established Soviet subtropical agriculture were but yesterday wondering how to adapt exotic plants to local conditions. Now that is not enough. The time has come to breed domestic forms of subtropical plants.

The Soviet Union already has an espalier, more frost-resisting kind of lemon. The hardiness of the Chinese varieties of tea has been combined with the fertility and flavour of Indian varieties. To protect the tea plant from the rigours of winter, attempts are being made to cultivate its annual shoots. The perennial quinine-tree, a native of Java, is being cultivated in Georgia as an annual herbaceous crop: in its native form it cannot stand a winter which, of course, is incomparably more severe in Georgia than in tropical Java.

ANIMAL HUSBANDRY

What is the state of stock-raising in the Soviet Union?

In places rich in meadows, pasture stock-raising is practised. Much excellent butter and milk comes, say, from the north of the European part of the land—the Vologda Region, the Arkhangelsk

Region, among others—and also from Western Siberia. The Baltic Republics have a highly productive stock-breeding industry.

Cattle are raised in considerable quantities near the towns in densely populated areas, as, for instance, in the central regions of the country and in the Ukraine. Stock-breeding in these districts gives much dairy produce and meat.

Animal husbandry is highly developed in the south-east where the dry steppes and deserts serve as grazing-grounds, as, for instance, in Kazakhstan, Central Asia and Azerbaijan. These regions give the land much meat, wool and skins.

In general, the Soviet Union occupies one of the leading places in the world as regards the number of cattle of various kinds. But animal husbandry is probably the most complicated branch of farming. A large number of favourable conditions are indispensable for its development. For many years this branch of agriculture in the Soviet Union failed to meet the demands placed on it.

At the present time, in connection with the general improvement in Soviet agriculture, the situation has taken a radical change for the better. In recent years much has been done to improve the organization of animal husbandry and to strengthen its fodder basis. In particular, many benefits have resulted from the more extensive use of maize for cattle fodder. And other measures have been taken too.

The result has been a rapid improvement in animal husbandry. Between 1953 and 1959 the number of cattle increased by 18.3 million head. Meat production increased by almost 50 per cent, milk production by more than 50 per cent.

In total output of milk, the U.S.S.R. overtook the U.S.A. as early as 1958. In per capita butter output it surpassed the U.S.A. in 1959.

At the present time everyone engaged in Soviet farming is working to reach this fully practical target.

During the Seven-Year Plan animal husbandry is planned to increase as follows: meat production is to be doubled, milk production is to rise by 70-80 per cent, wool production by 70 per cent.

IRRIGATION

The land area of the Soviet Union is vast. The sown area is about 200,000,000 hectares, more than in any other country of the world. The arable land in the Soviet Union is roughly equal to that of the U.S.A., Canada and Australia combined.

The Soviet land contains enormous, still untapped reserves of productivity. Before the Second World War the proportion of the tilled land to the total area, fluctuating widely from one natural zone to another, and attaining its maximum in the chernozem zone, was, on the average, about 10 per cent, while the sown area reached only 6½ per cent. In other words, by making an effort to master the less accessible land in the distant east, the cold north and the poorly-watered south, the U.S.S.R. was in a position to multiply many times over the production of agricultural produce. The virgin land of the eastern districts, the fertile grey soil of the still incompletely irrigated deserts, the swampy meadows of the podsol belt, and the vast expanses of mountain slopes, await human hands and extend unprecedented prospects for increasing social wealth.

Now we shall tell how in Soviet times the waterless deserts of Central Asia have been irrigated.

The plains of Soviet Central Asia lie almost entirely in the desert zone. In summer there is abundant heat, clear skies and a dry air. Amidst the sandy and saline expanses there lie many places with fertile grey soil.

However, the sun's warmth in which Central Asia is so rich, is insufficiently used for the needs of the national economy. That is because over large area the territory has very little water, and, after all, it is water which makes it possible to use the sun's warmth for plant cultivation. Sometimes not a drop of water falls in the desert during the whole summer. The soil of the Central Asian deserts grows very hot in summer, so hot that an egg can be easily boiled in the sand.

The absence of water obliges man to sink wells, and their depth

shows how great is the demand for water in the Kara-Kum Desert we find wells almost 250 metres deep.

From time immemorial human settlements in Central Asia were confined to the rare oases along the canals cut into the desert from the rivers

Soviet power found Central Asia a backward, semi-feudal, colonized land. Irrigation was organized in an extremely primitive way. The system of watering the land devised thousands of years ago was still being used. The dams had no cement in them and were swept away by the rivers. Millions of hours of arduous toil were wasted. There were, in fact, no large dams at all on the rivers. The canals, dug by hand with the assistance of mattocks, were quite small, and the water was often raised for the fields by so-called *chigiri*—wooden wheels with clay scoops, turned by camels.

In Soviet times, Central Asia has been completely transformed. In the place of the former tsarist colonies with poor inhabitants deprived of all rights, socialist republics, enjoying equal rights within the Soviet Union, have arisen.

A radical change has also taken place in irrigation methods.

The state has invested enormous sums in irrigation work, both in the form of money and of machines, the majority of which were specially designed for the requirements of Central Asia. Now on the fields of Central Asia over 30 types of various agricultural machines are working.

All irrigation work is founded on a strictly scientific basis. A whole series of special, newly-organized training establishments prepare qualified personnel for irrigation.

Irrigation work is of a co-ordinated nature: not only are new areas of arable land created, but in many places hydroelectric stations are built, and sometimes the new canals serve as shipping routes. The co-ordinated nature of the work is guaranteed by the fact that all branches of the economy are united by a general plan.

New irrigation work has expanded the sown area in the U S S R., the irrigated area has been almost trebled. New agricultural methods

have raised crop yields. As a result, the cotton crop, as we have mentioned above, has been multiplied several times over.

Nowadays new canals in Central Asia run for scores of kilometres and irrigate vast areas. Before very long the flow of all Central Asia's rivers will be completely under control.

Here are a few examples.

The new irrigation system in Tajikistan, for instance, has already rendered fertile thousands of hectares in the Vakhsh Valley: there the very best, long-staple cotton is grown now. Previously these parts were desert, a land of sun-cracked earth and wild reeds three times the height of a man. Canals were dug with the assistance of powerful excavators. The river was guided along a new bed which in places has been cut in the rock. The Vakhsh, fed by the melted ice of the Pamir mountain peaks, glides along a ferro-concrete channel, passes through "windows" with iron sectional sluices, and feeds a network of small canals.

In addition, large power stations are being built on the Vakhsh.

In its valley thousands of collective farmers have been settled. They came there from the grim Pamir Mountains. New villages were built for them. Roads were laid. The town of Kurgan-Tyube has grown up, there the biggest cotton-cleaning plant in Central Asia has been built. The Vakhsh Valley now gives more cotton than was picked in all Tajikistan before the Revolution.

Two years before the outbreak of war, 160,000 collective farmers—Uzbeks and Tajiks—dug the Great Ferghana Canal in six weeks. This is the Soviet Union's biggest irrigation project. In the old days such a job would have taken years.

Collective farmers also built the Uzbek Sea. This lies in the valley of the Zeravshan, not far from Samarkand. The Zeravshan Valley gives a quarter of all the cotton picked in Uzbekistan, but in summer the river does not contain enough water to provide for the irrigation of the fields. Now the water accumulates in a big reservoir near a dam. The capacity of the reservoir is 600,000,000 cubic metres. The spring waters are retained in the Uzbek Sea and distributed to the fields in summer.

In Kirghizia, in the upper reaches of the River Chu, where there is an oval hollow in the mountains, the big Orto-Tokoiskoye reservoir has been formed. This lies at a height of 2,700 metres above sea level and is not far from Lake Issyk-Kul. The hollow has been closed by a high earth dam and a tunnel has been driven for over half a kilometre through the rock to carry off the water. This reservoir makes it possible to regulate the flow of the Chu and to supply water to the irrigation canals on the extensive Chu Valley.

As yet not all the river water of Central Asia is being used for irrigation, and not all the fertile land suitable for cotton growing has been irrigated. Above all, the biggest river of Central Asia, the Amu-Darya, is not yet being sufficiently used for irrigation purposes.

In abundance of water the Amu-Darya is practically the equal of the Nile. It rises in the foot-hills of the Pamirs, flows from the mountains on to the plains, and after crossing them falls into the Aral Sea. Into this sea the Amu-Darya deposits about 2,000 cubic metres of water each second.

The waters of the Amu-Darya are twice as rich as those of the Nile in fertile sediment, the colour of café crème. The river not only irrigates the land, it enriches it.

Until recently the waters of the Amu-Darya were used mainly for irrigation purposes around the delta. Now steps are being taken to use the river in its middle course too.

Early in 1959, the first stretch of the Kara-Kum Canal was completed. About 300 powerful excavating machines and dredgers were used on this job.

The canal starts near the village of Bossaga which lies south of the town of Kerki on the Amu-Darya. On the first stretch no dams were required on the Amu-Darya. The new canal passes through an inhabited oasis, then forms a big sediment lake, and later on its course plunges into the sandy desert to join the River Murghab near the town of Mary. The first stretch of the canal is over 400 kilometres long. Until recently the Murghab Oasis—the main oasis in the Turk-

menian Republic—was short of water. Now it receives ample supplies of water from the Amu-Darya

The canal will flow further westward and provide water to the neighbouring Tejen Oasis. This second stage in the construction of the canal has been started. Subsequently the canal will reach the region of Ashkhabad, the capital of Turkmenia. The length of the three sections of the canal will be nearly 1,000 kilometres. The area of irrigated land will exceed 500,000 hectares.

RECLAMATION OF MARSHES

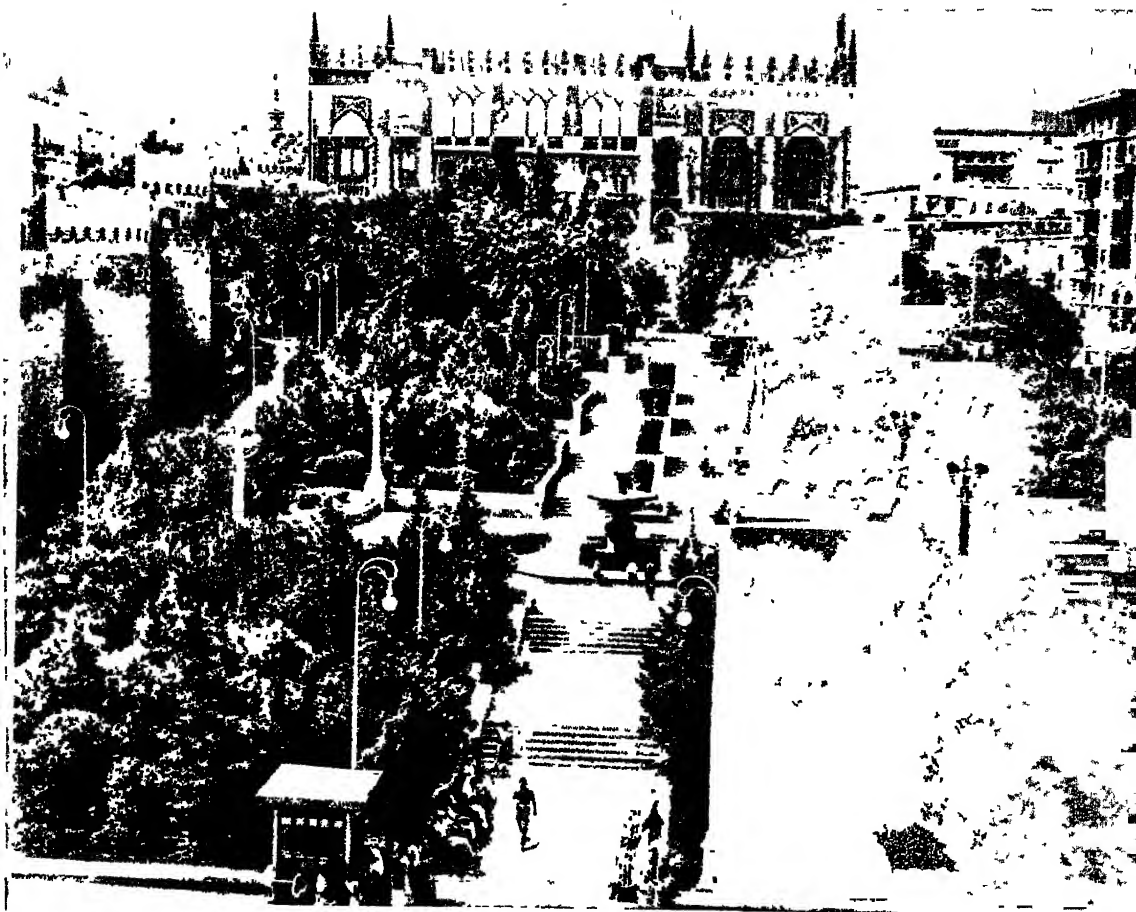
We have just seen how in the south water is brought to the fields. But in the more northerly regions it is essential to remove surplus water from the land.

In the north of the U S S R where evaporation is less than the precipitation there is a belt of marshland. It stretches with intervals from Byelorussia right across the country to the Far East. The water stagnates at the watersheds and in low-lying ground and renders it difficult for the air to reach the soil, thus hindering the activity of useful bacteria. Sedge, not to mention moss, grows in the marshes. This land is unsuitable for sowing and gives poor hay. It has to be drained.

In Soviet days much reclamation work has been done. The collective farms are gathering rich crops on land which was recently squelchy and damp. During the First Five-Year Plan alone more marshes were drained and reclaimed in the Soviet Union than during the entire 19th century. But this was only a start.

Reclamation work grows from year to year. The area of arable land and meadows reclaimed from bogs is constantly increasing. And in our days the reclaiming of the marshlands means creating a complex system of hydrotechnical works in strict accordance with a clearly defined system of agrotechnics.

Reclamation work is now almost fully mechanized. Excavators are used to widen and straighten rivers and to speed up their flow;



Baku, capital of Azerbaijan. On the left—
the ancient fortress



In the Caucasian Mountains

some of these excavators work not only on caterpillars but also on pontoons. Ditchers rip up the earth, and leave behind them straight, even trenches; in specially swampy places the ditcher is mounted on marsh skis. Machines are used to form networks of canals in the fields. And between the open canals, at a depth of about one metre, "mechanical moles" bore drainage tunnels to catch the water.

Marsh reclamation work is carried out in a co-ordinated way. it provides not only new arable land and meadows, but also new roads and waterways, some of them suitable for navigation, new centres of the fisheries industry, new opportunities for peat-digging. Melioration specialists, hydrologists, silviculturists, agronomists and ichthyologists work conjointly.

Before the Revolution, reclaimed marshland was allotted for meadows and hay fields. Now we find state and collective farms sowing them increasingly to hemp, vegetables, rye, flax and fodder crops.

Marsh reclamation is being carried out in many parts of the Soviet Union, in particular around Moscow, in Siberia, and in the Far East. But the principal region where it is going on is Byelorussia. There about a quarter of the entire territory consists of marshes.

And in Byelorussia the marshiest place of all is Polesye. It covers the whole of the southern part of Byelorussia and the extreme north of the Ukraine. Its boundaries are the sides of the triangle Mogilev-Brest-Kiev. Through this great trough-like depression the winding Pripyat flows sluggishly from west to east, towards the Dnieper, gathering the waters of smaller rivers on each bank.

Once this low-lying region lay at the edge of a glacier and the melting ice carried much sand into it. Sand has a tendency to accumulate water under itself. And the water does not cease flowing. It is constantly running along the beds of the streams down from the neighbouring heights, the "shoulders of Polesye." Furthermore, this is a region of abundant rains. Clearly, the Pripyat cannot manage to bear away to the Dnieper this surplus water. The subsoil waters remain close to the surface and form marshes.

Polesye used to be the most poverty-stricken corner of old Byelorussia, providing nothing but meagre sedge and bast for the local population's footwear. The fields yielded very low harvests, two-thirds of which went to the landlords. The neglected inhabitants of Polesye were always impoverished and hungry.

Now much of the marshland of Polesye has been reclaimed. In place of oozy, uninhabited thickets shrouded in mist, clouds of mosquitoes, and foul bog air, we find firm, dry ground. In place of impenetrable swamps we find collective farms, electric power stations, hemp factories, hospitals, schools, roads. State farms with thousands of hectares of land sown to grain have been established, they are among the largest of all the farms on reclaimed marshland.

The Soviet state is spending a great deal on land reclamation and on helping collective farms do their own land drainage work. The factories produce a large range of complicated machines for reclamation work.

On the reclaimed marshes of Polesye, advanced farms are harvesting up to 30-40 centners of grain per hectare, and up to 600-700 centners of vegetables. Many Polesian collective farmers have been decorated with the gold and silver medals of the U.S.S.R. Agricultural Exhibition. Many leading collective farmers have been awarded the title of Hero of Socialist Labour. One of them, for example, is Yevdokiya Kukhareva, who harvested over 30 centners of winter rye per hectare in central Polesye.

But although reclamation work is in constant progress the greater part of Polesye is still waterlogged.

At the present time a broad long-range plan has been worked out for reclaiming Polesye with the application of the latest achievements of science and technology.

This plan envisages extensive hydrotechnical measures which will embrace the entire Polesye depression. In time, 3-4 million hectares of land will be recovered from the marshes. The flow of water will be intercepted by a system of large reservoirs in the upper reaches of the Pripyat. The Pripyat itself will be deepened and straightened. Four hundred streams will be made to run faster. Open canals and

subterranean drains will pierce the whole of Polesye. The construction of sluices will help to control strictly not only the water regimen of wide areas but also of individual fields. Water regulation, the application of the requisite agricultural techniques and fertilizers, complete mechanization of labour, adherence to a co-ordinated plan in the use of natural resources—all this in combination will bring about an exceptional increase in productivity and turn Polesye into one of the most productive agricultural regions in the country. The crops of grain, hemp and vegetables will increase many times over, there will be much more hay to cut, and animal husbandry will thrive. Big orchards and vineyards will be planted. Forestry and fisheries will develop rapidly, the waterways will be improved. The application of peat and fertilizers will make the barren sand of today fertile. Industry too will spring to life—meat-processing factories, canning plants, sugar refineries, creameries, hemp factories. The production of liquid fuel will be organized. Power stations on the rivers and canals will provide electricity for industrial and domestic purposes in this reborn land.

FIGHTING DROUGHT

The steppe belt which extends from the Ukraine in the west to Western Siberia in the east is the most important agricultural part of the country, but a substantial part of this belt has insufficient humidity in summer. Drought was a constant plague in tsarist Russia. General droughts recurred every few years. Some areas of the country were partially affected by drought every year. In old Russia drought entailed famine for the people, millions of deaths. It attacked the main granary of the country and thus had the character of an extremely grave national disaster.

The small-scale, parcelled-out peasantry of tsarist Russia did not possess the power to combat drought. And from the state it received neither help to forestall drought, nor relief from its consequences.

The elimination of drought means challenging the climate. This was something quite beyond the powers of the small-scale peasantry.

Drought cannot be fought casually on individual sectors but only according to a single plan over enormous expanses

A struggle on this scale could be unfolded and, indeed, was unfolded, only after the successful introduction of collectivization. The kolkhoz peasantry, assisted by the state, opposed the elements with a powerful, mechanized, planned agriculture

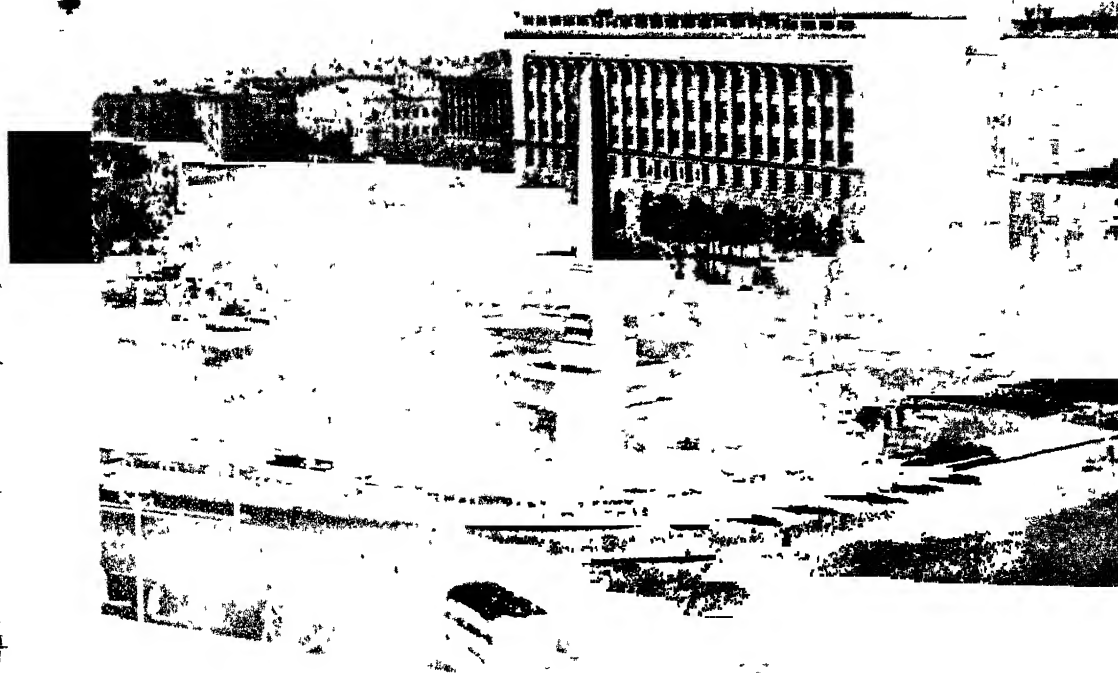
In the drought zone the collective and state farms now apply advanced methods of agriculture—deep ploughing and fertilization. Drought-resisting varieties of plants are bred. Most of the ploughing for the spring sowing is now done during the previous autumn. This helps the soil to retain moisture. The fields are shielded, brushwood is scattered over them, snow barriers and ice dams are built, corridors of sunflowers are sown. In these ways the snow is retained over millions of hectares, and this, consequently, retains moisture. Ponds and reservoirs for irrigating nearby fields are dug.

An important method for combating drought is the planting of shelter belts.

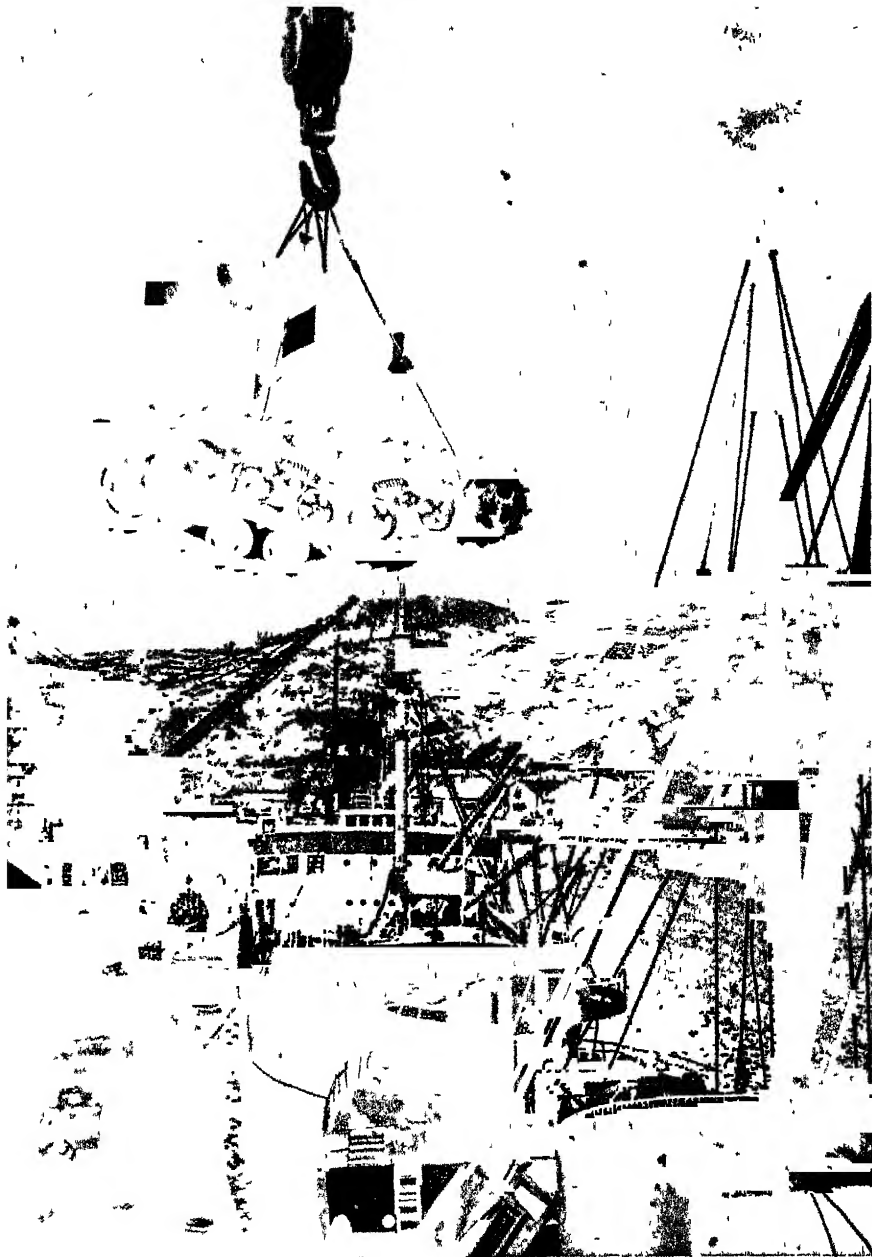
Trees have been planted over a vast area of the country—standing in belts across the prevailing winds, across the slopes down which the spring floods sweep. The trees planted in the treeless steppes protect the fields from the hot dry winds, delay the melting of the snow, hinder the flow of spring floods, and warm the winter crops. On fields bordered by shelter belts the speed of the wind is almost halved, and this means that evaporation is greatly reduced.

By the beginning of the war about 500,000 hectares of land in the Soviet Union had been provided with shelter belts and thousands of plantations of trees established. After the war even more rapid progress was made.

In the steppe and wooded steppe belts of the European part of the Soviet Union several large shelter belts, most of them 60-100 metres broad, have been planted. For example, the belt along the Volga, the belt running from the Urals to the Caspian Sea, etc. In addition, shelter belts 10-20 metres, and sometimes 60 metres broad have been planted with state assistance on collective- and state-farm fields.



The Square of the Fallen Soldiers, Stalingrad



In the docks of Kholmsk on the Sakhalin Island
in the Far East

In the steppe and wooded steppe regions of the European part of the Soviet Union lie 120,000,000 hectares of kolkhoz land. Into this territory Britain, France, Italy, Holland and Belgium could be fitted comfortably. And the landscape over all this vast expanse is being transformed.

Moreover, one must remember that the shelter belts have been planted not only in the European part of the country but in other parts too, such as the vast steppes of Siberia.

The transformation of nature is changing the appearance of the steppes and the wooded steppes. Woods are becoming an integral part of the steppe landscape. They stretch in long ribbons along the fields, covering waste land, sand and the slopes of ravines.

Now, among the open, closely ploughed steppes you see everywhere belts of young deciduous trees. The hot arid summer winds are already being broken by their ranks, and in spring they provide cover to hold the snow.

In several places the shelter belts have already reached maturity, as for example in the Novo-Annensky District of the Stalingrad Region, on the Gigant State Farm on the plains of the North Caucasus, and in other parts of the south.

Afforestation in the Soviet Union is not confined to the planting of shelter belts in the narrow sense of the word. Over wide areas sandy ground is being planted with trees, particularly in those sandy stretches along the lower courses of the Volga, the Dnieper and the Don.

The results of all this work in the struggle against drought are self-apparent. In the arid zone the land is giving bigger harvests than previously. Drought can still inflict serious damage on the Soviet Union but it can no longer amount to a national disaster as it did in the past.

During the Seven-Year Plan the struggle against drought will be carried a stage further. Farming methods will be improved; correct crop-rotations will be adhered to on a wider scale. More trees will be planted in the steppes.

RURAL ELECTRIFICATION

In the Soviet Union work is going on for supplying electricity to the countryside. Electricity in the collective farms is used for domestic and productive purposes.

In Soviet agriculture electric power is being combined with the earlier forms of mechanical power. This results in an increase in kolkhoz incomes and in a reduction of labour expenditure

At first the kolkhozes built small power stations, each for itself. But as time passed it became a more frequent practice to build more powerful stations by the combined effort of several kolkhozes. One such inter-kolkhoz hydroelectric station was built, for instance, near Lake Drisviaty at the junction of Byelorussia, Latvia and Lithuania. Created by the efforts of farmers of three nationalities, it was called "The Friendship of the Peoples"

Many of the rural electric stations are hydraulic. They do not only supply electricity. Their dams make shallow rivers navigable. The kolkhozes breed fish in the new-formed reservoirs and keep ducks and geese on the banks. Wherever necessary the water retained by the dams is used for irrigation.

In the heart of Russia, between Tambov and Morshansk, winds a small river called the Tsna, a tributary of the Moksha which flows into the Oka. On the Tsna and its tributaries more than 60 kolkhoz hydroelectric stations have already been built, and others are under construction. The Tsna has become navigable. And on the Moksha, at the place where the Tsna enters it, 60 kolkhozes have combined efforts to build the Rassypukhinskaya inter-kolkhoz hydroelectric station with a capacity of 2,000 kw. There are chains of kolkhoz power stations on many other rivers of the country.

At the present time the collective farms are obtaining electricity mainly from rural electric stations belonging to the state, as well as from the main state grid.

By the end of the Seven-Year Plan all kolkhozes and state farms will have been supplied with electricity. The use of electricity in agriculture will be roughly quadrupled.

RAILWAYS

Tsarist Russia had no few talented and skilful railway engineers, bridge builders and locomotive builders. The level of railway transport was, perhaps, higher than that attained by other branches of the national economy. Nevertheless, in the backward country the railways too bore traces of backwardness. The railway engines were low-powered. The passenger cars were considered the best in Europe but the freight cars were small, twin-axled, and known as "boxes"; rolling down an incline, the engine would whistle and men on the platforms would turn a hand brake.

Together with the rest of the national economy, transport too has grown in the Soviet Union.

The new industry gave many thousands of railway engines, hundreds of thousands of carriages, tankers and flat-cars. Railway engines became more powerful, freight cars more capacious.

The most modern engines, electrically or diesel driven, were introduced. Before long they will have replaced steam-engines completely. The production of steam-driven railway engines has already been curtailed in the Soviet Union.

Semaphore signals have become a rarity; they have been replaced by light signals. Hand brakes have been replaced by automatic brakes. Coupling is also done automatically now.

Two figures suffice to illustrate the achievements of Soviet transport: since the Revolution the total length of railway lines has been more than doubled, while freight turnover has increased twenty-fold. This indicates that the railways are now working better and that they are carrying bigger loads. In the number of ton-kilometres per kilometre of track the Soviet Union long ago surpassed the United States and now occupies the first place in the world.

Many single-track lines have been double-tracked. For example, the Great Trans-Siberian Railway was single-tracked, except for the middle section, Omsk-Baikal. Now it is entirely double-tracked.

But the economy of the country has been relocated and the flow of goods has taken new courses. It has not been enough to reinforce

the old lines. The transport map has had to be modified together with the industrial and agricultural maps. New lines have had to be laid, running in new directions. And much has been done, especially in regions that used to be remote and lacking in railways.

In tsarist times the central part of Russia had about 18 kilometres of railway line per thousand square kilometres, while Siberia had only one kilometre and Kazakhstan and the Far East less than one. During the years of the five-year plans the national economy moved eastward and in the East arose Soviet socialist republics, a new culture. It was there, over thousands of kilometres of distance, that railways had to be laid, replacing horse-drawn carts, pack camels and paddle-vessels by modern trains.

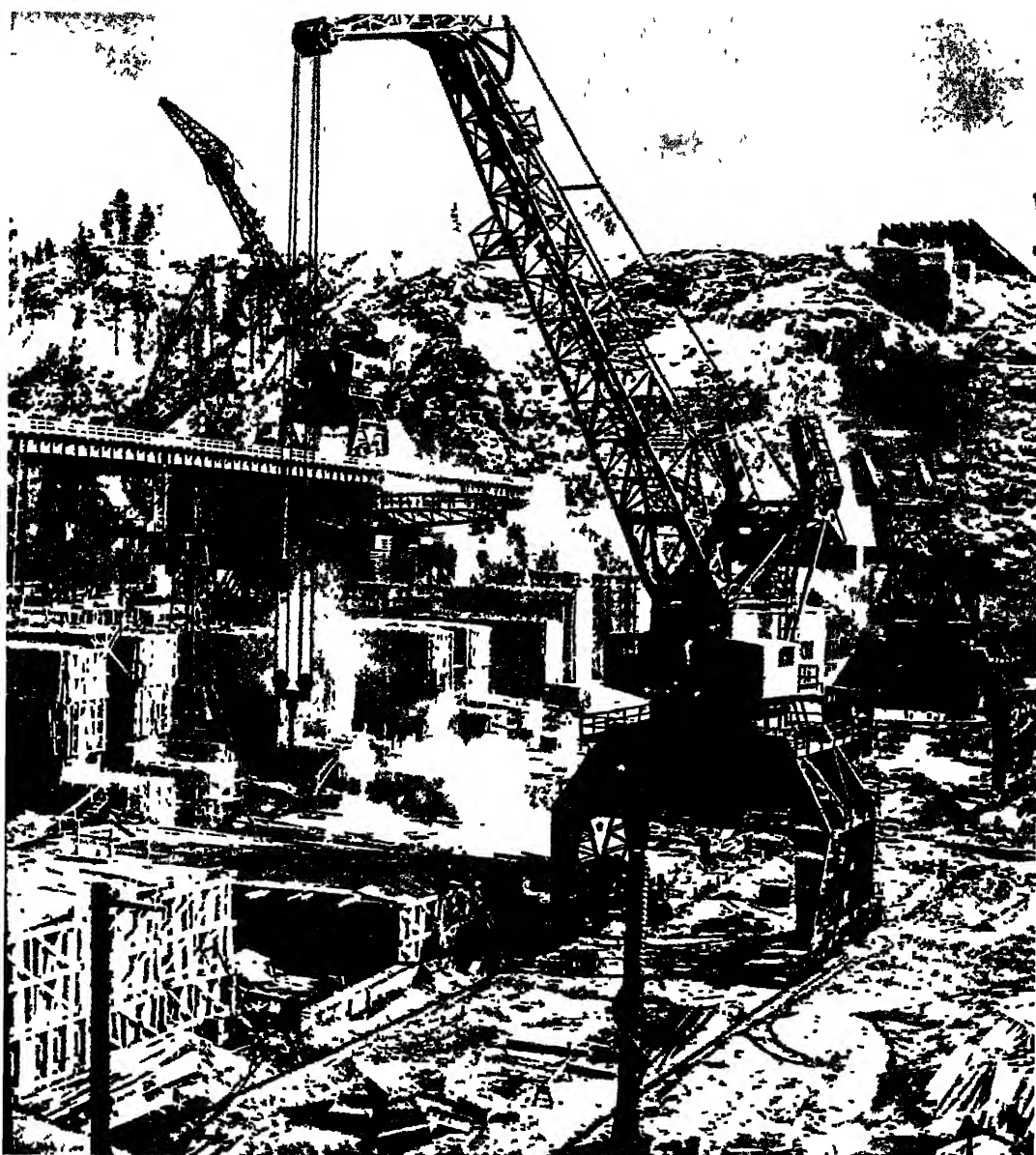
The new tracks crossed former deserts and uninhabited territories and laid the foundations for industry and advanced agriculture in what had been neglected and savage parts.

Hitherto a single railway line—the Great Trans-Siberian—had crossed broad Siberia. During recent years it has been largely rebuilt. Now in Western Siberia the track is electrified. By the end of the Seven-Year Plan the entire 9,000 kilometre line from Moscow to the Pacific Ocean will be electrified. High-speed electric trains carry heavy loads across the flat plains of Western Siberia. The Soviet Union is building the longest electric line in the world.

But one line, even with such improvements, is not enough for modern Siberia. And so a second main line, the South Siberian, has been laid.

This line begins near Magnitogorsk in the Southern Urals and runs eastward through Akmolinsk, Barnaul and the Kuzbas to Abakan in the Yenisei Valley. The distance from Magnitogorsk to Abakan is over 2,000 kilometres. The ore and metal of the Southern Urals, the grain of the Trans-Urals steppes, Kazakhstan and the Altai, the salt of Kulunda, the coal of the Kuzbas, the timber and ores of Kuznetsk Ala-Tau—such are the riches that are strung out on the pivot of the South-Siberian Railway.

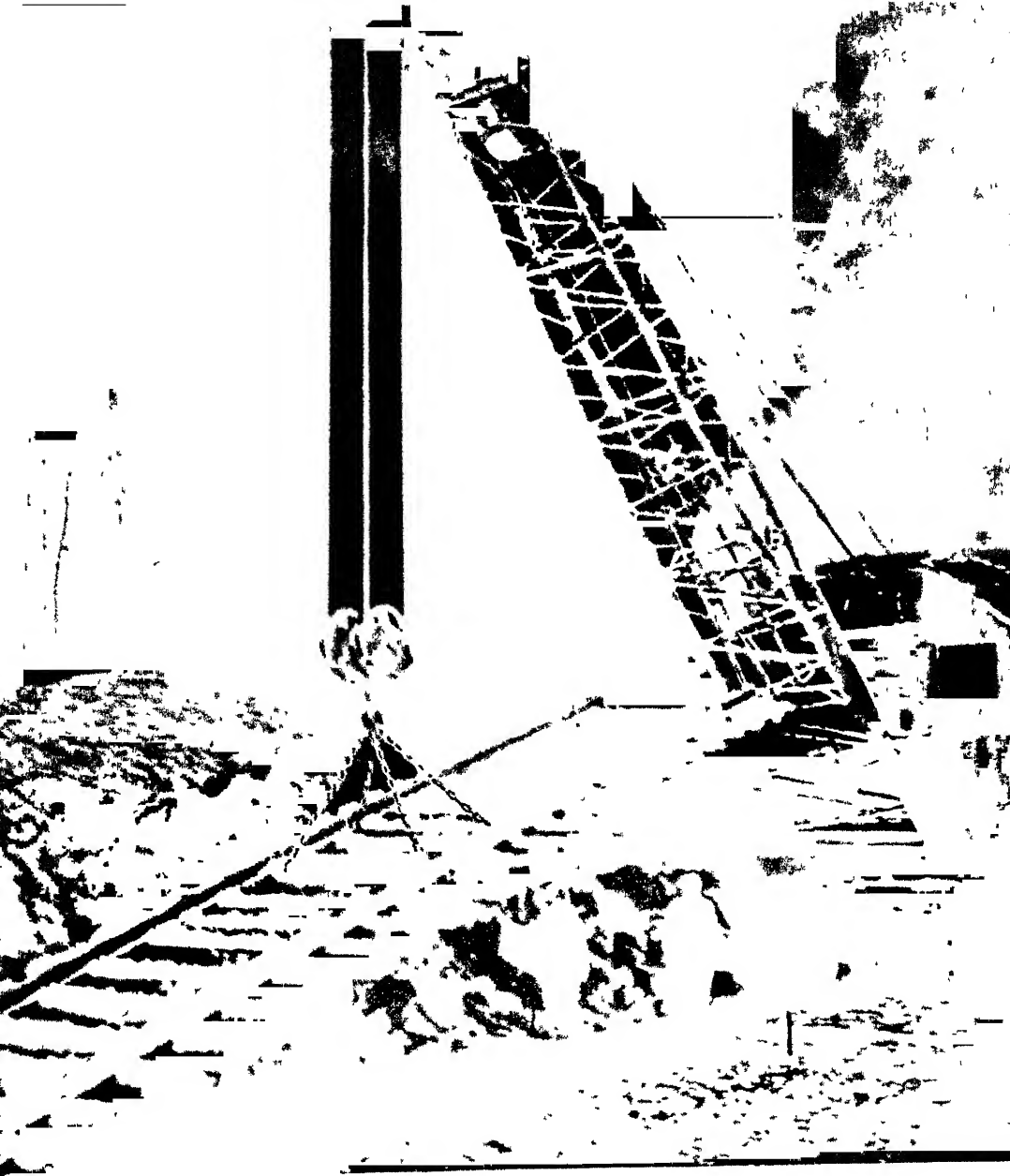
In Western Siberia the Great Trans-Siberian Railway is no longer the only latitudinal line of communications.



The construction site of the Bratsk Power Station on the Angara in Siberia



Railway line being laid in the Siberian taiga





Angarsk, a new town in Siberia

The Trans-Siberian line runs straight as a thread. The longest railway in the world it used to serve only a narrow strip along its own course and those of the rivers it crossed. Now, however, the line sends out shoots all along its length. Altogether there are many hundreds of kilometres of branch lines

Central Asia and Siberia are two enormous neighbours. But though in the past they had railway connections with Central Russia, they had none between themselves. To travel from Tashkent to Irkutsk you used to have to take a train from Asia into Europe and then back into Asia.

In Soviet times, which brought new life both to Central Asia and to Siberia, the Turksib Railway was built to connect them. It is nearly 1,500 kilometres long. Siberia began to provide Central Asia with what it lacked: timber, coal, grain. And from Central Asia cotton was shipped to the new textile mills of Siberia.

But it is a matter not only of transit. The Turksib brought life to the whole of South-East Kazakhstan. The railway reached Alma-Ata, the capital of Kazakhstan and brought it out of its remote corner into the life of the whole country.

Penetrating into distant national regions transport facilitated their advance. The Turksib stimulated the cultural rise of Kazakhstan.

Many other lines have been built in the Soviet Union. The Seven-Year Plan will see a radical technical reconstruction of transport.

The Soviet Union occupies the first place in the world for the length of electric lines, but during the Seven-Year Plan there will be a greater expansion of work on electrifying the railways. After all, in productivity an electric locomotive is equivalent to four steam-engines and, besides, saves fuel. Altogether the network of electric lines will be roughly trebled. Electric traction will be introduced in all major lines.

Together with electric locomotives, diesel locomotives will be much more extensively used. The proportion of freight turnover effected by electric and diesel locomotives will increase from 26 to 85-87 per cent. The length of railway line adapted for electric and diesel traction will attain a figure of about 100,000 kilometres.

The construction of more railway lines is envisaged. During the Seven-Year Plan about 9,000 kilometres of new main lines will be laid, and about 8,000 kilometres of the lines will be double-tracked.

The latest methods of automation and remote control are being extensively applied to rail transport.

RIVER TRANSPORT

Before the Revolution, river transport in Russia was weak and run down. The rivers were shallow, there were shoals, the ships were small, and loading and unloading were done manually.

Now river transport has been improved. Cheap and capacious, if rather slow, it is an important auxiliary in the Soviet Union's national economy.

Many new ships, faster and more modern than before, now ply the rivers. In the past, timber rafts used to drift gently down the rivers. Now they are towed. River steamers are much speedier.

Where there were shoals the rivers have been deepened by powerful dredgers.

Cranes, elevators and transporters have been installed on the riverside wharves.

For the first time river vessels have been able to reach districts that used to be backward and isolated. For example, shipping on the Pechora crosses the Arctic Circle. Ships now sail the hitherto unnavigable Kura in Transcaucasia. There is now a shipping fleet on Lake Balkhash amidst the desert of Kazakhstan, another on Lake Issyk-Kul amidst the snow-clad peaks of Kirghizia. The rivers of northern Siberia—the Pyasina, the Chirchik, the Indigirka, the Kolyma—are now navigable.

In addition to this work on the country's natural waterways, artificial waterways are being created.

In the old days only shallow-draught ships were able to reach Moscow through the old locks. Now that incongruous situation has been corrected. In 1937 a deep canal was dug, linking the Volga and the Moskva. It is known as the Moscow Canal.

The gently-sloping uplands between the River Moskva and the Upper Volga are intersected by a canal 128 kilometres long. Electricity forces the water to flow not down, but upstream: five automatic stations with propeller pumps force the water up to the watershed. During the navigation season the flow is roughly equivalent to three such rivers as the Moskva in summertime.

After the reconstruction of the dams across the Moskva its level near the Kremlin was raised by nearly three metres. The river became abundant in water. Steamers, refrigerator vessels and self-propelled barges pass under Moscow's bridges. Three-deck ships sail freely from the capital to the Volga and hence to the Caspian and the Black Sea. Moscow is linked by deep waterways with the main rivers of the country.

But that is not all: the canal supplies Moscow with water for industrial and domestic use. After remaining in forest reservoirs for a hundred days and depositing its sediment, half the water taken from the Volga flows into pipes.

In 1933 the Stalin White Sea-Baltic Canal was opened. A strip of water 227 kilometres long crossed the watershed at a height of 108 metres and linked the White Sea with Lake Onega, which had been connected with the Baltic earlier.

In 1952 the Lenin Volga-Don Canal—101 kilometres long—was commissioned. This provided an exit to the Black Sea of the hitherto enclosed Volga Basin. In other words, all the seas of the European part of the Soviet Union are now connected by waterways.

During the Seven-Year Plan a deep Volga-Baltic waterway will be completed. It will link the basin of the Baltic Sea with the Volga, replacing the so-called Marinsk Water System which has existed nearly 150 years and is quite obsolete. On the new canal—361 kilometres long—a system of reservoirs, locks and power stations will be established.

During the Seven-Year Plan the role of river transport in the national economy will become more important, especially in Siberia.

Besides river transport, sea transport is of great importance in the Soviet Union. A substantial part of the cargoes connected with foreign

trade are shipped that way. But sea transport is important inside the borders of the country too.

During recent years the technical equipment of sea transport has been improved. Many large ships have been built, ports have been reconstructed, and loading and unloading work has been mechanized.

Motor transport is developing rapidly in the Soviet Union. In terms of kilometre-tonnage, motor transport does far less work than railway or river transport, but in terms of tonnage of loads carried it is ahead of railways and riverways together.

Many new motor roads have been built. Among them are the main roads from Moscow to Minsk, Simferopol, and Leningrad. The Soviet Union has a big road-building programme before it.

Air transport is developing rapidly both on domestic and international lines. Moscow is connected by air with many foreign cities. The air transport system is equipped with first-class propeller and jet planes.

PROGRESS IN THE REDISTRIBUTION OF INDUSTRY

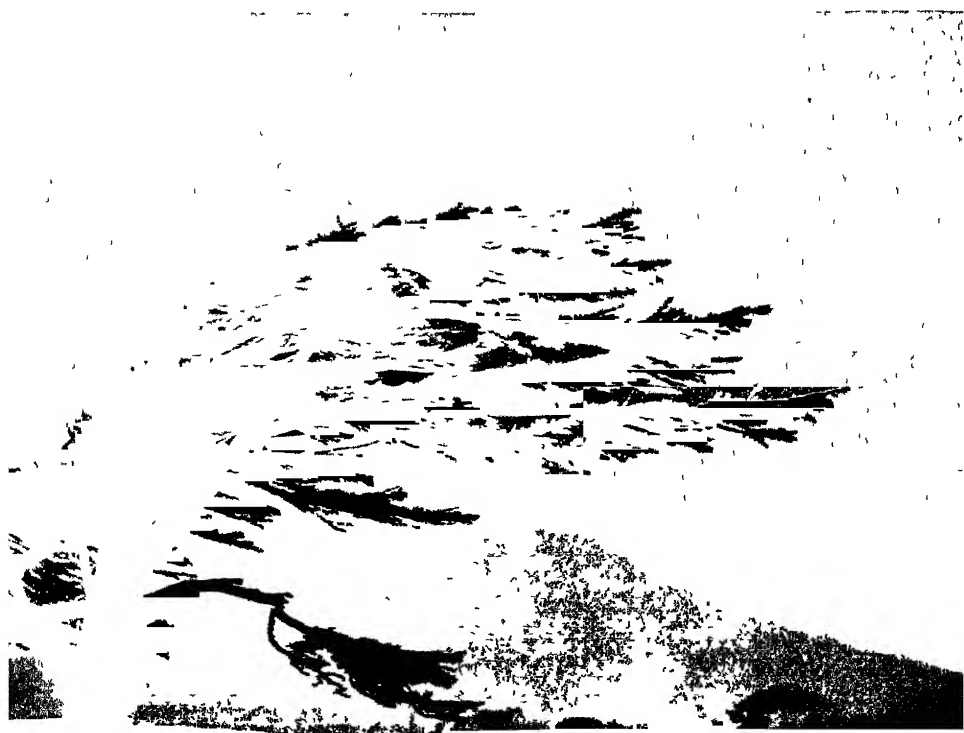
The extensive industrialization of the Soviet Union has naturally brought about great changes on the map showing the location of industry. The economic map has taken on an altogether new look. It has become denser and more uniform.

Before the Revolution, Russia's industries were huddled together in a few isolated areas—in and around Moscow, in St. Petersburg, the Donbas, the Urals, Baku, the Baltic ports. In Soviet times industry was dispersed over the country, providing each of the Soviet nationalities and each region with support for its economic and cultural development.

The production of machinery is no longer confined to a few cities as it was in tsarist days. Tractors are made in the Urals and in the Altai, cars in Byelorussia and Georgia, machine tools in Novosibirsk, railway engines in Buryatia beyond Lake Baikal. Power stations, coal-mines, meat-packing plants, bakeries, garments factories have sprung up on all sides. The foundations for a future unified elec-

Lake Baikal





On the Kuriles

tricity grid have been laid, providing a firm framework for the uniform distribution of industry.

An industrial civilization has spread right through the vast land, a vivid example is provided by the establishment of an institute of nuclear research in Central Asia, a part of the country where forty years ago the inhabitants were almost completely illiterate and industry limited to stripping fibre from the cotton balls. Now, in Novosibirsk, the Siberian branch of the Academy of Sciences has been organized, for the industrial growth has conditioned the establishment of a large scientific centre, at a cost of about 1,000 million rubles, in this previously backward area.

During the five-year plans all branches of industry, both extractive and manufacturing, were more uniformly distributed than previously. The Ukraine not only increased coal extraction and metal making, it reinforced its power supplies, introduced the manufacture of chemicals, and built intricate machinery, its economic structure lost its unbalanced character and gained a new harmony. Yaroslavl on the Upper Volga began to produce not only automobiles but also the lacquer and synthetic rubber for them. Spinning and weaving, the production of fertilizers and agricultural machines have been introduced into the cotton lands of Central Asia. The lines of the different branches of local industry interweave and deliberately form strands of mutually dependent industries. One might say that in various parts of the country there have grown not disconnected "organs" of industry but more or less integrated industrial "organisms." Under our eyes this process of co-ordinated development of regions has created conditions for switching from departmental control of industry and construction to an improved territorial system.

Now most of Soviet industry and construction is run by local economic councils formed on the basis of the administrative economic regions, which number about one hundred. The work of these economic councils is supervised by the Council of Ministers of the respective republic. In this way the role of the republics in economic leadership has grown significantly.

Some work remains to be done to obtain still better co-operation within each economic region as well as between separate regions throughout the country

The eastward move of industry, as we have seen, will continue during the Seven-Year Plan. Over 40 per cent of all capital investment is allocated for the eastern regions, including the Urals, Siberia, the Far East, Kazakhstan and Central Asia. New industrial centres are being built there, such as those of Kustanai, Pavlodar-Ekibastuz, Achinsk-Krasnoyarsk, Bratsk-Taishet.

The redistribution of industry has given rise to many new connections within the country and consequently the role of transport has changed.

In tsarist days, the trains that ran from the outlying regions along the radial lines leading to Central Russia brought raw materials and took away manufactured goods. Today, too, large quantities of manufactured goods go to the outlying regions and the factories of the Centre still receive many raw materials from the periphery. But these flows of goods have lost their previous antagonistic sense and their exclusive character. Socialist industry has sprung up all over the country, the peripheral regions have come to stand on their own feet, colonialism has been banished once and for all. The regions have entered into mutually advantageous economic relations with each other. And Soviet power, more than doubling the length of the railway lines, has not only strengthened transport connections between the Centre and the periphery, it has also connected the various parts of the country with each other by railways, motor roads and waterways.

A new transport map, characteristic of an all-round development of the country, is taking shape. But this process is still far from completion—many tasks lie before the Soviet people in their vast land: the laying of new railway lines and motor highways, the harnessing of rivers, port construction. . . .

Since the Revolution the agricultural map of the country too has become far more rational.

The adoption of socialist ways in the countryside and the mechanization of peasant labour made it possible to erase those abnormalities and shortcomings in the exploitation of the land which had their origin in the predatory nature and backwardness of tsarist agriculture.

The economic map reflected the rapid expansion of the area under grain. Arable land expanded everywhere but especially in the east. A sharp leap was taken recently when extensive areas in the steppe belt beyond the Urals came under the plough. In a short spell highly valuable natural resources which had remained untapped for centuries were drawn into production. Before the launch of the intensified campaign for the cultivation of the virgin and long-fallow land east of the Urals, the amount of arable land in the Soviet Union had increased since 1917 by an area equivalent to the size of France. And during three years of work on this territory an area bigger than the whole of Italy was added.

In many of the new areas, however, the question was not merely of tilling the land: the soil had first to be prepared for ploughing. In the hot south the waters of the rivers had to be channelled off and diverted for irrigation purposes; in the north marshes had to be drained and shrubs uprooted; in the mountains the slopes had to be terraced. Over an enormous area people changed the surface of the earth. This work to bring into production areas hitherto untouched has left its mark as one of the major achievements of the Soviet people.

Important changes took place in the distribution of crops. Maize began to be grown almost throughout the country, wheat penetrated beyond the chernozem zone, sugar-beet was no longer confined to the Ukraine: it reached the Primorye Territory in the Far East, around the cities and towns vegetables were grown, and for the first time in history the Urals and Siberia got apples of their own.

However, in remaking the agricultural map many tasks remain to be fulfilled. One of them is to attain a correct scientific combination of various branches of agricultural production inside each

region And this refers not only to the necessity of combining different crops but also to the correct and mutually advantageous combination of agriculture and animal husbandry.

POPULATION. NEW TOWNS

According to the 1959 census the population of the Soviet Union is 208,800,000.

The population is densest in the west but in recent years the general eastward shift in the national economy has resulted in a certain displacement of population in that direction. This is shown, among other things, by the establishment and growth of new towns

In tsarist Russia the overwhelming majority of the population lived in the countryside. The rapid growth of Soviet industry has brought about a big increase in the urban population, a process that is still in progress. Before the Revolution the urban population amounted to less than 20 per cent of the total population, today it makes up almost one half.

The urban population has increased with the growth of old towns and the creation of new ones Since 1917 the number of towns in the U.S.S.R has increased by several hundreds In the Urals, Siberia, and the Far East two-thirds of the towns are new. In the national republics of Soviet Central Asia about half the towns are new.

In the Soviet Union new towns are built according to plan, on scientific principles. There are special institutes for town-planning and construction.

New towns are appearing in empty places or are growing out of villages and workers' settlements.

An example of a new town, built on vacant land around a new factory, is provided by Rustavi in Georgia, on the banks of the River Kura. A few years ago a big new metal works was built there Beside the factory, beyond a belt of trees, a beautiful town has been built, spacious and bright, with arches and light balconies and avenues of plane-trees and cedars.

The Klyuchevskaya Volcano in Kamchatka





In the Soviet Arctic. The Laptev Sea

Many of the new towns that have sprung up out of nothing are connected with the extraction of minerals. In the heart of Kazakhstan, for example, the mining town of Karaganda has arisen. It occupies an area of over 600 square kilometres. Karaganda is a town of large houses, machine-building works, higher educational institutions, a research institute, hundreds of schools. But previously all was semi-desert there. At the present time the Karaganda Region produces more coal than did all tsarist Russia.

For almost twenty-five kilometres along the River Ural stretches Magnitogorsk built near iron-ore workings and a gigantic new metal works.

On the extreme north of Siberia, beyond the Arctic Circle, has risen Norilsk, a town of asphalted streets and five-storey houses. In the extreme south the Turkmenian oil town of Nebit-Dag has sprung up despite the sand-storms that rise in the Kara-Kum and pile up sand dunes among the oil-derricks.

There are towns that have been founded in formerly uninhabited places by the coming of the railways and the development of the waterways. The biggest of these have arisen in places where new waterways have been opened up.

Near the estuary of the Lena on the Arctic Ocean—a place to which river vessels from Yakutia sailed to meet the ships of the Northern Sea Route, the Arctic port of Tiksi has been built, and this became the basis for a new town. On the lower stretches of the Yenisei, at a place which ocean-going vessels could reach, the new town of Igarka was founded, to become Siberia's most important sawmill centre. In 1928 the settlement had a population of only forty-three.

Also in the north, and also close to water, was built the new town of Magadan, now a regional centre. It is located on the north coast of the Sea of Okhotsk, near Nagayev Bay. There sea and river communications meet. Ships from Vladivostok berth there. A motor road—the Kolyma Tract—runs from there. Magadan is the headquarters for the tapping of the riches of north-east Siberia. It has a fine maritime station, many blocks of large dwelling-houses, a dignified look-

ing House of Culture, cinema theatres, factories, a recreation park, a museum But the dense undergrowth of the taiga stretches right up to the walls of the first houses of the town.

Many towns have grown out of villages and hamlets which had no industry before Although these towns cannot be said to have sprung up in entirely uninhabited places, they too must, of course, be considered new

The oil industry, for example, has turned the Bashkirian village of Ishimbayevo into the town of Ishimbai The Altai Tractor Works have turned Rubtsovka into Rubtsovsk Out of the *kishlak* of Assake the Uzbek oil town of Leninsk has sprung up, and another *kishlak*, Begovat, has become the town of the Uzbek metal workers. Yesterday, mud huts with flat roofs—today stone houses, pavements, electricity, shops, a recreation park, a belt of orchards round the town

Twenty-five years ago where the town of Komsomolsk-on-Amur now lies stood the village of Permskoye There, in dark cottages amidst dense forest on the banks of the wild river lived fishermen, descendants of the first settlers from the Urals. They numbered 160. In 1932 young men and women from Moscow, Leningrad, Kharkov and other towns arrived there and laid the foundations of the industrial town on the Amur

The walls of factories rose, one after another streets were carved out of the taiga, brick and stone houses were built The tilted cottages remained on the banks of the river. And in their way they too served the new town: before people were moved into the first new houses, they lived in those cottages. The new took off, as it were, from the old.

Now Komsomolsk-on-Amur has a population of over 177,000, tall houses, settlements of cosy cottages, avenues, squares The first builders who lived in dug-outs and cottages, the carpenters, navvies and woodcutters have become foremen, technicians, engineers, heads of workshops and factories It was, incidentally, at Komsomolsk-on-Amur that the hero of Boris Polevoi's novel *The Story of a Real Man*, Alexei Maresyev, began his eventful life.

In most cases the new towns are growing out of workers' settlements. When a region is drawn into the stream of mighty industrial

development, the workers' settlements enlarge, adopt the appearance of towns and at a certain stage of growth are given the status of towns by law

In the Donbas about fifty new towns have grown out of workers' settlements.

The Kuzbas too has seen the rapid transformation of numerous settlements into towns. Even before the war the new towns of the Kuzbas—Kemerovo, Anzhero-Sudzhensk, Prokopyevsk, Leninsk-Kuznetsky, Kiselevka and others—had over a million inhabitants between them.

Many towns, both large and small, have arisen in the national regions of the East. Now there is a whole network of towns there. Of Kirghizia's four towns, for instance, three are new.

National towns are a reflection of the new status and the rise of cultural standards in the national republics. Besides, they are centres of new industries.

The capitals of whole states have been rebuilt. Tajikistan has become a socialist state, a constituent republic of the Soviet Union—and in place of the *kishlak* Dyushambe, it has its capital Stalinabad. The town has risen at the threshold of the Pamirs; it possesses big buildings and factories, an Academy of Sciences, and has become the centre of Tajik literature and art.

Towns continue to be born in the Soviet Union. They are growing rapidly, underlining the pace of development of all life in the country.

The Soviet land is inhabited by peoples of many nationalities, both large and small: there are over 100 million Russians while in the Caucasus there are peoples who live in a single village.

Altogether, the Soviet Union has over 100 nationalities. Each of them has its own language, and these languages differ from each other as the past histories of each nationality differ. For instance, there are preserved examples of written Georgian going back 1,500 years, while the Nivkhi people, inhabiting Sakhalin, attained literacy only after the Revolution of 1917, together with forty other peoples.

The Russians who make up more than half the population of the Soviet Union, inhabit the central, northern, and some of the southern

regions of the European part of the U.S.S.R., as well as the Urals, Siberia, and the Far East. Some Russians also live in other parts of the Soviet Union

The south-west of the Soviet Union is inhabited by Ukrainians, who constitute one-fifth of the total population, and also Moldavians. In the west, we find Byelorussians, Lithuanians, Letts and Estonians; in the north-west, Karelians

In the north and north-east of the European part of the U.S.S.R. we find, in addition to Russians, the Komi and Nentsy peoples; in the east, the Tatar, Udmurt, Bashkir, Mari, Chuvashi and Mordovian peoples.

The Caucasus is inhabited by Georgians, Azerbaijanians, Armenians, Russians, Ossets, Kabardinians, Abkhazians, Adjars and others.

Kazakhstan and Central Asia are inhabited by Kazakhs, Uzbeks, Tajiks, Turkmenians and Kirghizians

In Siberia and the Far East we find, besides Russians, the Buryat, Khakass, Tuva, Yakut, Evenki, Chukchi, Koryak and other peoples

All the nationalities of the Soviet Union enjoy equal rights. In accordance with the principle of equal rights and free self-determination proclaimed by Soviet power they formed national republics. These republics united voluntarily in the Union of Soviet Socialist Republics—the U.S.S.R. By agreement the Union republics transferred to the Union a number of rights—for instance, general economic planning, the control of defence, etc. In other matters the republics enjoy complete sovereignty. Any one of them has the right to secede from the Union at any time.

The U.S.S.R. is constituted of fifteen completely equal Union republics, some of these, moreover, have autonomous republics, autonomous regions, and national areas within their borders

In the following chapters we shall describe each of the Soviet republics in turn.

UNION REPUBLICS

THE RUSSIAN FEDERATION

[Area: 17,077,000 square kilometres. Population: 117,500,000]

The Russian Soviet Federative Socialist Republic (R S F S R) is the biggest of the Union republics both in area (over three-quarters of the total territory of the U S S R) and in population (over one half of the total population).

Other peoples besides Russians live in the R.S.F.S.R. They form within the republic several autonomous republics and regions, and national areas. For that reason the Russian Republic is known as a federative republic.

The Russian Republic is the biggest not only in area and population. It is the largest of the republics in an economic sense. It produces about two-thirds of the country's total industrial product. It provides particularly large quantities of machines, timber products, metals, textiles and chemicals.

During the Seven-Year Plan the Russian Federation, like the Soviet Union as a whole, will continue to develop rapidly. During this period the gross production of the republic is to increase by about 80 per cent. In individual branches of industry the growth of production envisaged will be even more rapid: for example, oil output will increase by 110 to 130 per cent, the extraction and production of gas will be almost sixfold, of aluminium roughly threefold, of synthetic fibres and of sugar more than threefold.

The Russian Federation plays a very important part in Soviet agriculture, too. It produces on its boundless fields an enormous quantity of wheat, rye, oats, flax, potatoes, and sunflower seeds; it

raises many cattle. In all branches of agricultural production a considerable expansion is envisaged by the Seven-Year Plan. Sugar-beet production, for instance, will be more than doubled, the production of vegetables is to be raised by 140 per cent, of meat by 120 per cent.

The country within the borders of the R S F S R is extremely varied

The capital of the Russian Federation is Moscow which is also the capital of the Soviet Union. Of the other large cities in the Federation, Leningrad is the most outstanding. The Federation contains important regions such as the Volga Basin, the fertile land on the banks of the southern rivers—the Don and the Kuban—the Urals, vast Siberia, the Pacific coast, the broad expanses of the Arctic

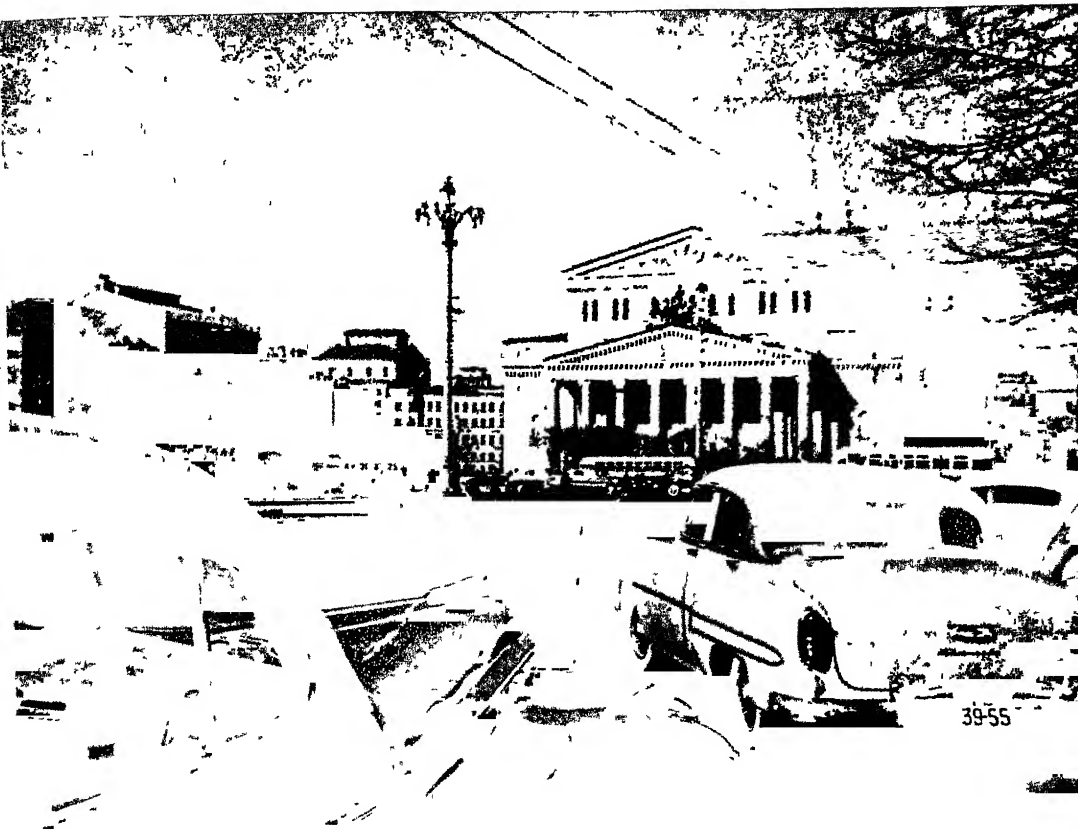
MOSCOW

Moscow is first mentioned in the chronicles in 1147, but archaeological excavations show that it existed still earlier.

In the centre of Moscow stands the Kremlin. You can see its jagged greyish-red walls above the River Moskva, the faceted tops of its tall towers, covered with dark-green tiles, and crowned with coppery-gold weather-vanes. The five highest spires bear ruby stars. Palaces and gold-cupolaed cathedrals rise behind the walls on an emerald mound.

Moscow is not only the political centre of the Soviet Union, it is the cultural centre. In Moscow the U.S.S.R. Academy of Sciences has its seat. The city has more than 150 museums and exhibition halls, about 30 theatres, more than 70 publishing houses and over a thousand of public libraries. There are 86 institutions of higher learning in Moscow, catering for more students than does the whole of Britain and France combined.

Moscow is the largest city in the Soviet Union. Its population exceeds five million, not including the outskirts



The Bolshoi Theatre, Sverdlov Square, Moscow





The Peter I Monument, Leningrad. Across
the Neva—the Peter and Paul Fortress



At the Exhibition of Soviet Economic Achievement in Moscow

Moscow is the most important industrial centre of the Soviet Union. It produces several times more industrial goods than all Russia produced before the Revolution.

In Soviet times Moscow's industries have greatly changed. In the past the metal-working industry was weak. But during the five-year plans enormous new factories making intricate and precise machines, electrical equipment and chemicals were built in Moscow. Textile, garment, footwear and food industries were established or renovated. They continue to expand.

Moscow is planned on the principle of concentric rings intersected by radial roads. These radial roads, heading in every direction, were the trade routes. The rings gradually expanded and the city walls were built. Between the radial roads lay an intricate maze of narrow streets and alleys.

In old Moscow it was almost impossible to find a straight street. The ancient city was not built, it grew. The coachman made his own road with his wheels, the pedestrian trod out a path—and the city repeated the pattern in its streets.

There were practically no streets dating from a single period. The city had no conception of preserving obsolete structures—dilapidated buildings disappeared by themselves and young ones sprouted up where they could. Everything lay in a jumble: old Russian churches with carved stone, onion-shaped cupolas and low squat columns; noblemen's mansions, often timber-built, rather provincial-looking in the classical style; the imposing façades of official buildings in Moscow Empire style; mansions of wealthy merchants in the pretentious style prevalent at the beginning of the 20th century; the brick buildings of the "rent-houses," erected before the First World War by house-owners who had grown rich, houses which tried to conceal their bareness with some timid ornamentation.

After the Revolution a new, Soviet Moscow broke through this confused and motley world.

The reconstruction plan preserved the principal basis of the old planning but threw out the junk. Old Moscow was a city of cobbled,

narrow streets, low houses, innumerable churches. Now we find a city of broad main streets and many-storeyed buildings.

The dusty-red tone of brick, the dark-brown tone of timber, have yielded to the bright grey of ferro-concrete, to the white, yellowish or golden shades of ceramic facings. The corners of sagging little houses jutted out on to the narrow pavements. Now these wooden houses have been replaced by new buildings. Gradually the whole street grows up to their level. The new houses often stand some way back from the pavement and by their frontage we can guess where the "red line" runs—the line up to which the street will soon be widened. In many places the main streets have already been widened and the people of Moscow enjoy long views for the first time in the history of their city.

An underground railway—the Metropolitan—has been built. Lines radiate from the centre of the city and across these a circular line has been laid, so that the map of the Metro corresponds to the historical plan of Moscow.

The River Moskva, freshened with the water of the Volga, has risen to a level that previously it attained only when in flood. New bridges, with high curved arches, span not only the river itself but the embankments too, forming main roads without transversal intersections.

New schools have been built in all parts of the city and have become familiar features of the Moscow landscape. New theatres have been built. Pleasantly laid-out recreation parks have been opened. A huge new sports stadium—the Lenin Stadium—has been built at Luzhniki.

Previously the streets of Moscow lacked verdure. In recent years, however, trees have been planted along the pavements of many streets.

Gas is brought to Moscow along newly-laid pipes. At the same time, the electricity supply has been increased. A high-voltage power line thousands of kilometres long brings the capital electricity from the Volga power stations.

During the five-year plans, Moscow got its first district heating plants. They provide not only electricity but heat to thousands of

dwellings and factories. No other city in the world makes such extensive use of this form of heating as Moscow.

On the northern outskirts of Moscow an Exhibition of the Economic Achievements of the U.S.S.R. has been organized amidst flower-beds and green lawns. It consists of the Main Pavilion, pavilions of the Union republics in national architectural styles, and many other pavilions and buildings, hot-houses, greenhouses, experimental plots and an extensive orchard. Near the Exhibition the Main Botanical Gardens have been laid out, they have samples of the flora of nearly all the world.

In recent years several sky-scrapers have been built in Moscow, including the new building of Moscow University on the Lenin Hills. This thirty-two storey building is almost a quarter of a kilometre high. Its spire is the highest point not only in Moscow but in the whole of the Great Russian (East European) Plain. This complex of buildings contains hundreds of lecture-halls and many scientific studies, museums, libraries, clubs, gymnasiums. The University has its own astronomical observatory and a spacious students' hostel. In order to see everything you would have to walk 150 kilometres.

The reconstruction of Moscow continues. In 1958 alone over 100,000 families in the city received living quarters in new, well-appointed houses. But the housing shortage still persists. During the Seven-Year Plan, Moscow is going to build about 20,000,000 square metres of new housing. In other words, inside the present city a new city almost twice the size of all pre-Revolution Moscow is going to be built, a city incomparably more beautiful and comfortable than old Moscow.

LENINGRAD

Leningrad, situated in the north-western part of the U.S.S.R. at the estuary of the Neva on the Gulf of Finland in the Baltic Sea, is, in population, the second city of the Soviet Union after Moscow. In 1703, the Peter and Paul Fortress was built in the delta of the Neva,

and this marked the foundation of St Petersburg, renamed Leningrad after Vladimir Ilyich Lenin. St Petersburg was the capital of Russia from the time of its foundation up to 1918

By dint of much arduous work the Russian people raised a majestic city on the marshy land.

Wide avenues run straight as a die into the distance. Well-proportioned columns break up the smooth grey façades of the buildings. The Neva is confined between granite embankments. A hundred islands are connected by five times as many bridges. The damp earth is covered with asphalt and stone. The enormous dome of St. Isaac's Cathedral breaks the monotony of the flat surroundings, and the soaring spires of the Admiralty and of the Peter and Paul Fortress somehow seem to raise the low coast line which is only just above the level of the sea. The marshy Neva delta has been humbled, regulated and ennobled by this city.

An entire epoch in Russia's history is connected with St. Petersburg. The city was the stronghold of the tsarist autocracy, but it was there, too, that the liberating forces matured. St. Petersburg was the hearth of an obscurantism which tried to stifle everything living, but it was in that city that, despite everything, a progressive Russian culture grew. It was there that Lenin forged the most advanced shock troop of revolutionaries. From there in autumn 1917, the news went out to the entire world of the victory of the Soviets.

During those memorable days and nights of October 1917, around the building known as Smolny armoured cars stood, bonfires blazed, and the clash of arms rang out. Workers' detachments, and squads of soldiers and sailors streamed there in preparation for the assault on the Winter Palace. The Smolny was the headquarters of the Socialist Revolution. In a large hall in this building Lenin announced that the Revolution had taken place.

St. Petersburg was the most developed industrial centre of Russia and when the Soviet land began to industrialize the government turned Leningrad into a centre for the mastering of complicated methods of production with which the country was at that time unfa-

miliar. To this day Leningrad has the role of being one of the major centres of the land for technical progress

Leningrad is primarily a metal-working city, a city of machine-builders. We find there such large and advanced machine-building works as the Kirov (former Putilov) Works, the Elektrosila Works, etc. The most intricate machines are produced in their shops.

Leningrad, however, is not only a city of precision machines, electric equipment and chemicals. Its light industry is highly developed. The skilful hands of Leningrad workers have made its light industry famous throughout the land.

The sea coast near Leningrad has not only sandy beaches, parks with avenues of trees running down to the water, yachting clubs, there are long stretches of wharves, the towering cranes and derricks of Leningrad port, the largest in the Soviet Union.

Leningrad is famous throughout the U.S.S.R. as a leading cultural centre. In the city are located about fifty institutions of higher learning and 150 scientific research institutions.

Leningrad has many very rich museums, including the famous Hermitage Gallery and the Russian Museum. Former tsarist palaces, including the Winter Palace, have been converted into museums. There are many historical monuments in the towns of Pushkin (formerly Tsarskoye Selo) and Petrodvorets (Peterhof) near Leningrad.

On the outskirts of Leningrad congested areas of old wooden houses have been replaced by hundreds of tall brick buildings, schools, clubs and Houses of Culture.

During the war against Nazi Germany Leningrad was under siege for nine hundred days. The enemy trenches reached the south-western suburbs. The Nazis bombarded Leningrad from the air and with heavy artillery. They wanted to destroy the city.

But Leningrad fought back staunchly and survived the ordeal. The Soviet Army routed the enemy outside Leningrad.

The city suffered great damage of which not a trace remains today. Its industry long ago passed the pre-war level of output. Many new buildings have been erected since the war. An underground railway has been constructed.

During the Seven-Year Plan, Leningrad will continue to advance. In particular, its power supply will be greatly improved from the southern regions of the European part of the R S F S R. gas will be brought in capacious pipes. Leningrad's industrial output is to advance by over 50 per cent, mainly by raising productivity of labour.

THE VOLGA

The Volga may be said to personify Russia. Not for nothing is it known as the great Russian river.

It was on the Volga, at Ulyanovsk, that Lenin, the founder of the Soviet state, was born.

The waters of the Volga lap the stones of Stalingrad where the Soviet army routed the Nazi invaders in what proved to be the turning-point in the Second World War.

Down the Volga long rafts are towed between the broad green banks; they are overtaken by white passenger vessels; coming upstream to meet them are oil-tankers and coal barges. The wavy line of low hills on the right bank, clothed in apple orchards, slope down to the water's edge, sometimes steeply, sometimes gently. In its upper reaches the Volga runs through forest, in its lower reaches, through steppe.

The Volga rises as a barely noticeable stream in the marshes on the Valdai Heights, north-west of Moscow. The silvery stream runs with a faint murmur among the birch-trees and the firs, it tugs at the reeds, it twinkles over the pebbles. Then it flows through forest lakes, gathers in from left and right the water of its tributaries and grows, finally, into a mighty river.

Near Gorky the Volga is joined by the Oka. These two rivers together define the limits of the area known as the Volga-Oka Watershed. It was in that area between the rivers that the Moscow Rus was born.

Below Gorky the Volga describes a broad even curve.

Beyond Kazan the Kama, gathering the waters of all the Western

Urals, flows into the Volga on the left bank. During the spring floods the river used to attain a breadth of from twenty to forty kilometres at this point. Sometimes the level of the Volga would rise fifteen metres in spring. But this no longer happens. The flow of the Volga is now regulated by the dams that have been built across it.

After having taken in the Kama, the Volga flows south past Kuibyshev, Saratov and Stalingrad towards the Caspian Sea which it enters near Astrakhan.

The Volga is Europe's longest river. In its course it crosses a considerable part of the European territory of the U.S.S.R. More than one-quarter of the entire population of the land lives in its basin.

The Volga is the Soviet Union's main waterway. Along it is borne as much cargo as is shipped by all the other rivers of the country together.

Before the Revolution there were few factories in the Volga Basin. The main industries were milling and distilling. On the wharves stevedores used to work for a pittance from dawn to dusk. The towns were built of wood, most of the houses were single-storeyed. Life on the Volga before the Revolution, a life full of suffering for the working people, has been described in the books of Maxim Gorky, a native of those parts.

Industry, particularly machine-building, has developed rapidly in the Volga Basin since the Revolution. The wood-working, food, and light industries are growing.

Big factories have been built along the entire course of the river. Among them are the Gorky Automobile Works, the Saratov Synthetic Alcohol Factory, the Stalingrad Tractor Works, the Red October Metal Works in Stalingrad, etc. On the northern shores of the Caspian the fisheries have been expanded.

The mineral deposits of the Volga Basin were not studied in the past and were written off as poor. But now important supplies of mineral resources have been discovered there. The discovery of oil is of particular importance. Extensive oilfields have been topped in the Zhiguli Hills. Besides, oil has been struck in Tataria, near Saratov, Stalingrad and elsewhere. In the Saratov area natural gas

is being extracted and sent to Moscow by pipeline. During the Seven-Year Plan the oil and gas industries of the Volga Basin are to be rapidly expanded.

In Soviet times the towns of the Volga Basin have grown up considerably Gorky, situated on the Volga close to the influx of the Oka, has become a major industrial centre. The city's new and reconstructed factories produce machine tools, ships, radio equipment and much else. The Gorky Automobile Works is to be numbered among the big car-producing factories of the world. The town of Kuibyshev is growing fast too. It has some large machine-building works.

During the pre-war five-year plans Stalingrad acquired some big factories of various kinds and became one of the most important industrial centres in the land. During the war the city and its factories were destroyed. After the expulsion of the enemy, the Soviet people, at the price of great effort, rebuilt the ruined town in a few years. Indeed, Stalingrad was built anew. The city's industry surpassed the pre-war level of output long ago.

There are three autonomous republics on the Volga, members of the Russian Federation. They are the Tatar, Mari and Chuvash autonomous republics. Together with the whole of the Volga Basin they have made great strides forward in their economy and culture.

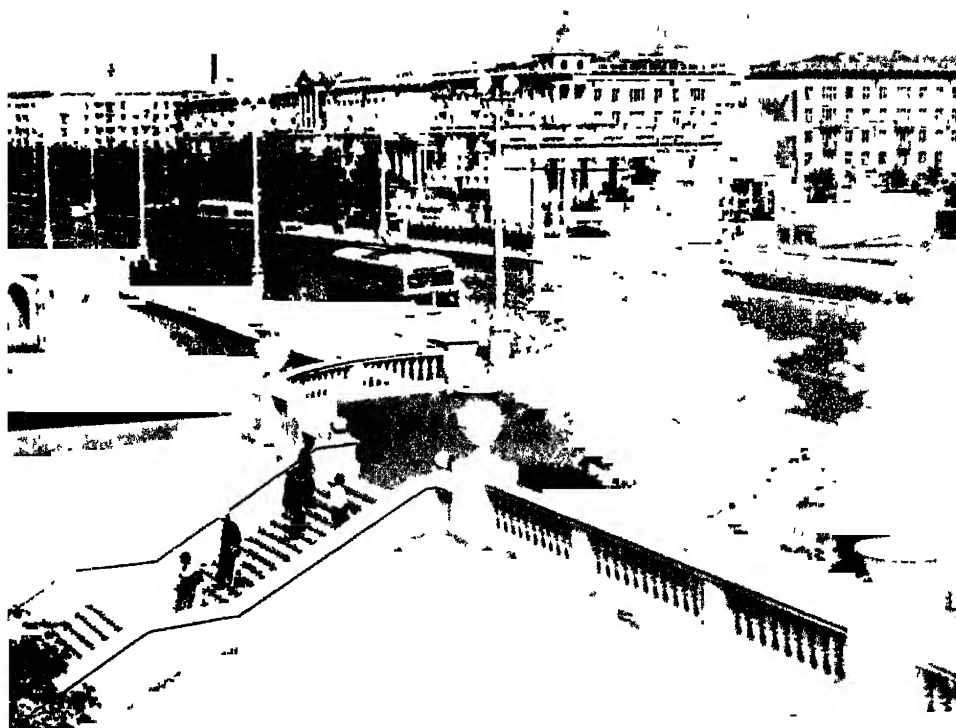
The Volga intersects densely populated, highly developed regions of the Soviet Union that have no coal of their own. From the first years after the Revolution steps were taken to fulfil a tremendous development programme on the Volga: the river had to be made to produce electricity and, at the same time, to serve as a good shipping route.

The Volga development programme was initiated in the upper reaches. During the Second Five-Year Plan a relatively small power station was built at Ivankovo where the Volga-Moskva Canal starts. Behind the dam lay the Moscow Sea.

Before the Second World War another, more powerful station was erected, lower down the Volga, at Uglich. And in November 1941, after the outbreak of war, the Rybinsk Power Station, still farther down stream, began to produce electricity.



Trenches for citric plants in the Crimea



Minsk, the capital of Byelorussia

The Rybinsk Sea was formed, flooding all the low-lying land between the Sheksna and the Mologa. It is half as big as Lake Onega, the second lake in Europe. It is so broad that the coasts are invisible from the middle. Fishermen ply on the lake in sea-going launches. In stormy weather the waves reach the height of a man.

On the land destined to be inundated, forests were levelled, houses dismantled, the inhabitants of 600 villages and six towns, including Mologa, were resettled.

Immediately after the war construction work started near Gorky on a power station more powerful than the Rybinsk Station. Thousands of millions more kilowatt-hours of electricity. The point at which the Volga was harnessed was pushed further and further down stream. This power station has now been completed.

A decisive blow remained to be struck: to bridge the Volga where it ran fastest, at the crest of its power, at a place where having taken in the water of the Kama, it flows at its full breadth. Then the problem of remaking the Volga would have been fundamentally solved.

And so, in 1950, work began on building power stations near Kuibyshev and Stalingrad, each with a capacity of over two million kilowatts. The Kuibyshev Power Station, now the biggest in the world, has been completed, and is now known as the Lenin Volga Power Station. The Stalingrad power station is approaching completion and has been partly put into commission. The entire output of electricity of pre-Revolution Russia in ten years was less than what these two stations will generate in a year.

On the basis of cheap electricity the chemical treatment of oil, machine-building and the production of consumer goods are increasing in the Volga Basin. But the Volga is so rich a source of electricity that the economy of the Volga Basin alone cannot use it all. Electricity from the Volga is already reaching the central regions and the Urals.

The dam of the power station near Kuibyshev has checked the flow of the Volga, and now for hundreds of kilometres stretches the new Kuibyshev Sea, bigger in surface than the Rybinsk Sea. The area of

the old town of Stavropol, has disappeared under the water, the town being removed on a hill; the Volga now reaches Kazan which used to be five kilometres from the river bank

The giants of Kuibyshev and Stalingrad are decisive steps in the harnessing of the Volga. Decisive, but not still final steps. After their completion, about three-quarters of the total power of the river will be harnessed. To take what remains a number of missing links will have to be added: a power station needs to be built at Cheboksary between Kuibyshev and Gorky, another at Balakovo near Saratov, between Kuibyshev and Stalingrad. Then the steps will merge into a single water staircase, the lower head of water will reach the adjacent upper head of water, and the river in the old understanding will disappear and turn into a chain of lakes with a slow current, without spring floods.

The building of the Cheboksary and Saratov power stations is a task for the near future.

THE URALS

Among the Soviet Union's industrial regions the Urals region may be singled out. It lies along the Urals Range which divides Europe and Asia. It contains several administrative regions and two autonomous republics, Bashkiria and Udmurtia which form parts of the Russian Federation.

The low, gently-sloping Urals stretch in a long belt from north to south, from the Arctic Ocean to the steppes of Kazakhstan. For many millions of years, water and sunshine, frost and wind have cut and worn down the Urals, exposing the valuable deposits that lay in their depths. No region in the world is so rich in minerals. Here over 800 different minerals, over 120 of them used in industry, have been identified. Along the entire mountain range runs a deposit of high-grade iron ore, in many places there is copper ore, and bauxite, the raw material for aluminium; there are large deposits of potassium salt, pyrites, asbestos, and considerable quantities of

oil, gold, chrome and nickel. The Urals are world famous for platinum and semi-precious stones found there. The latter include emeralds, amethysts, jasper, malachite, mountain crystal and topazes.

But the Urals region is short of coal suitable for metal smelting. Before the Revolution pig iron was smelted in these parts exclusively with the use of charcoal. Technological knowledge was acquired slowly in the Urals of tsarist times.

In Soviet times, however, the five-year plans changed the Urals into a region of powerful modern industry. The Urals became one of the chief links in the Urals-Kuznetsk Combine of which we have written above.

During Soviet times enormous metal works have been built in the Urals. Magnitogorsk alone gives more metal than all the works of tsarist Russia did in 1913.

Not only pig iron and steel but non-ferrous metals are made in the Urals. Big power stations supply the factories with electricity. Chemicals, timber and light industries have been built up.

Machine-building, especially, has reached a high level of development in the Urals. Among the huge works that grew up there under the five-year plans mention may be made of Uralkhimmash, producing equipment for the chemicals industry, Uralelektroapparat producing electrical equipment, Uralvagonzavod, the main source of the Soviet Union's railway waggons, and Uralmash, which manufactures the most highly perfected machinery for heavy industry and for the building industry, in particular, enormously powerful walking excavators with scoops of 25 cubic metres capacity and beams 100 metres long. A giant of this kind does the work of 30,000 men.

In Soviet times, the towns and cities of the Urals have changed beyond recognition. Take, for example, Sverdlovsk. Sverdlovsk lies in the middle section of the Urals, on the eastern side of the range. It is a major industrial centre. An electrical equipment industry has been set up there. It has many institutions of higher learning and scientific institutions, good theatres and museums. Its streets are lined with new buildings. The Urals branch of the U.S.S.R. Academy of Sciences has been established there.

Or take Chelyabinsk. This town is located on the Siberian side of the southern part of the Urals. In tsarist times it was a small trading town. Now it is a big industrial centre. Among other factories a large works for building caterpillar tractors has been established there. Coal is mined near Chelyabinsk. Big power stations have been built.

The autonomous republics of the Urals region have developed in all respects. Bashkiria, for example, has become an important region of the industrial Urals. Its capital, Ufa, has grown into a large industrial town. Bashkiria produces metal, machine tools and electrical equipment. In many parts of the republic various minerals are mined and worked up. Oil is extracted; it was tapped in Soviet times. At the present time Bashkiria produces more oil than did all Russia in tsarist days.

Bashkirs drew up a written language only after the Revolution. For the first time the Bashkir people were able to read literature in their own language. Institutions of higher learning were opened.

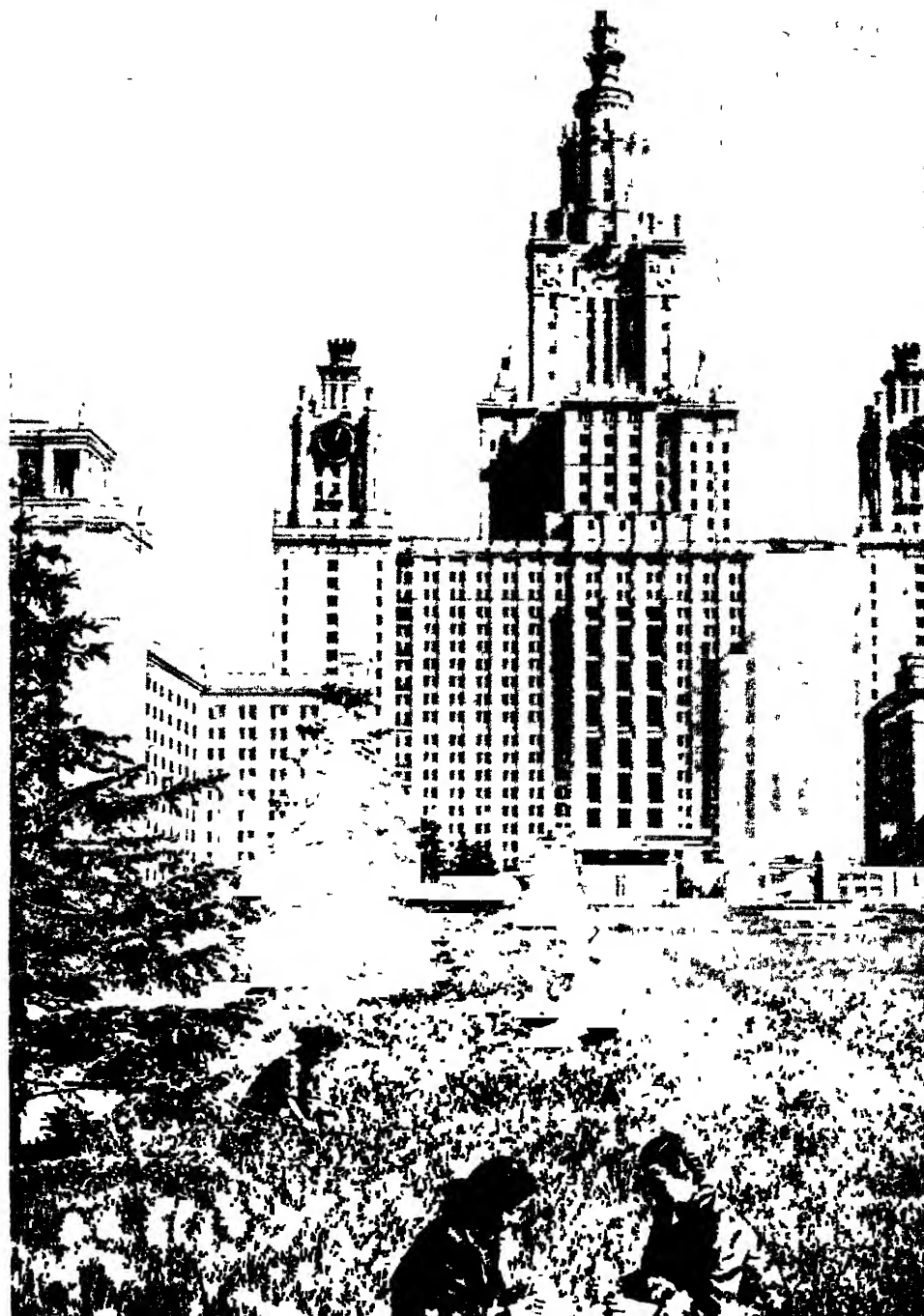
During the Seven-Year Plan the Urals will continue to develop rapidly. It will remain in the lead in the Russian Federation for the production of ferrous and non-ferrous metals and of heavy machine-building. The Seven-Year Plan envisages a further growth of the metallurgical industry, of the oil, chemicals and timber industries, and of machine-building. There will be more power available partly in the form of natural gas, piped from Uzbekistan. In 1965, the Chelyabinsk administrative region of the Urals will be making more pig iron than all France makes today.

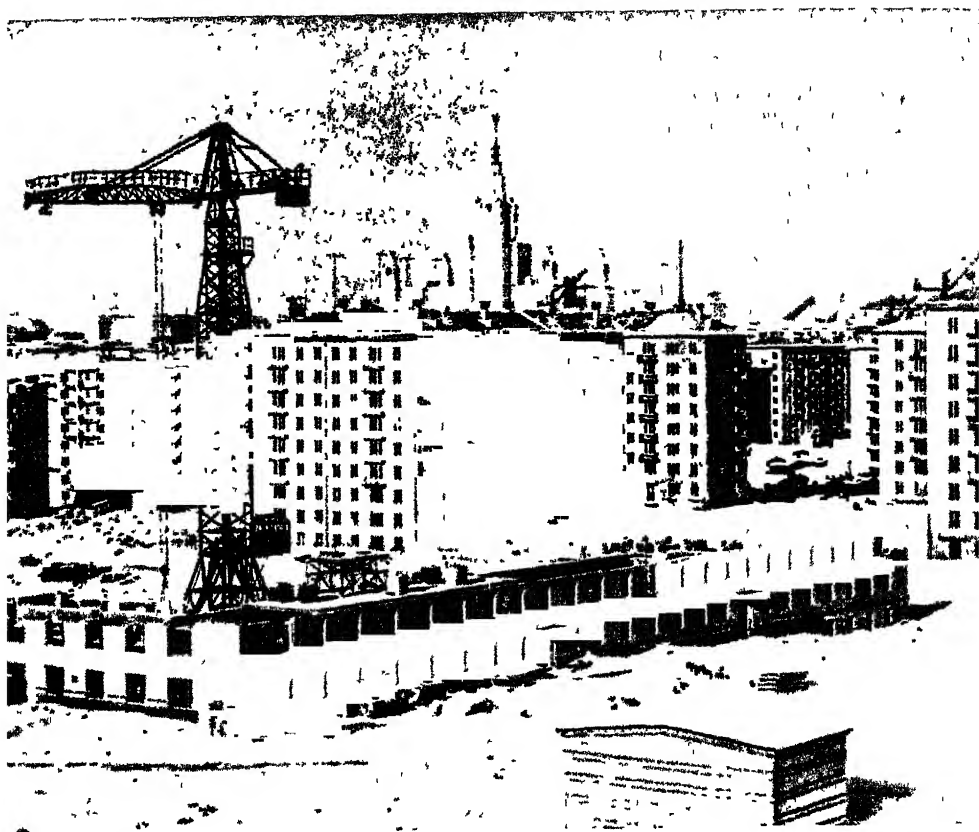
SIBERIA

Siberia occupies almost one half of the entire territory of the Soviet Union. It is nearly as large as Europe and somewhat larger than the U.S.A.

In Western Siberia the West-Siberian Lowlands stretch from the Urals to the River Yenisei. Long ago this region had hills which

Moscow University on the Lenin Hills





Houses under construction in south-West Moscow

were probably quite high, but later on were levelled and eroded and went below the waters of a sea. During a period of millions of years this sea deposited on its bed clay, sand and grit, and then it subsided and the flat bed was revealed. And so in Western Siberia the formerly hilly land is now a flat plain.

Farther east the picture is different. The vast expanses between the Yenisei and the Lena are occupied by the Middle Siberian Plateau. This is formed of tough rock and lies about 500 metres above sea level. Here too in the remote past the sea stretched and covered the ancient granite foundations with various strata of sediment. The sea receded and the land rose and became a vast plateau intersected by river valleys.

From the east and south towards the Middle Siberian Plateau run mountain ranges. These are—on the south—the Altai, Sayan, Trans-Baikal, Yablonovy and Stanovoi ranges; on the east, the Verkhoyansk and Kolyma ranges. Worn smooth by the passage of time these mountains are now covered with forests of conifers. Only here and there do they lift above the taiga their rocky, wind-eroded summits—*goltsy*—attaining a height of about 3,000 metres above sea level. Between the mountain ranges lie undulating plateaus, marshy depressions and deep hollows; in the deepest of these hollows Lake Baikal has been formed.

Siberia is rich in rivers. Rising in the mountains in the south and crossing a vast territory in their northward flow run the three biggest rivers of the Soviet Union—the Ob, the Yenisei and the Lena.

The climate of Siberia is extreme and continental with wide fluctuations between summer and winter temperatures. The further east one goes the more extreme is the climate.

During winter in Eastern Siberia a zone of high pressure (anti-cyclone) sets in.

A winter morning with 30°C of frost looks something like this: the snow, seen through the early morning haze, wears a bluish look—the reflection of the bright dome of the sky. The squeak of the sledge runners can be heard two kilometres away. The stoves are lit, and columns of smoke rise straight into the air from the chimneys. The

sun looks like a circle of red-hot metal. During the day-time everything sparkles and glitters—the sun, the snow. The haze disappears. The blue sky is permeated with light. You look up at it through the window of the warm house and say to yourself “It looks like summer,” but outside in the yard the frost is only slightly less intense than in the early morning. However, although the frosts of Siberia are intense they are not to be feared. They are easily resisted: the air is dry, there is no wind.

In summer, on the other hand, in clear, sunny weather the air gets very hot and the pressure is low.

Near Verkhoyansk and Oymyakon, where in winter the northern hemisphere’s “cold pole” is located, cucumbers, tomatoes and early varieties of wheat ripen in the open in summertime. At Yakutsk temperatures up to $+38^{\circ}\text{C}$. are recorded.

Siberia is so vast that it has several natural belts. The tundra changes into coniferous forest—the taiga. South of the taiga we find wooded steppes with lakes and clumps of birch. Still farther south the wooded steppe gives way to the feather-grass of the dry steppe.

The virgin steppe is particularly beautiful in spring. The sun rides high over the steppe and in the still unspent humidity of spring the steppe is ablaze with brightly-hued pasque-flowers and lychnis. Amidst the tender green of the young grass glitter yellow and blue irises, multicoloured tulips, golden butter-cups and white anemones.

The natural riches of Siberia are immense. First of all there is the mineral wealth—the coal of the Kuzbas, Yakutia, the Tunguska and Minusinsk coal-fields; the iron ore of the Trans-Urals steppes, Gornaya Shoria and the banks of the Angara, the non-ferrous metals of the Altai; gold, diamonds, graphite. And how much unprospected wealth still lies hidden in the bowels of Siberia!

The great Siberian rivers can give much power. There are few places in the world capable of providing such a concentration of cheap electricity.

Siberia is rich in timber, too. A part of its timber is sent westward by railway, a part is floated down the great rivers, mainly

the Yenisei. At Igarka on the Yenisei the timber is sawn and shipped to Europe along the Northern Sea Route.

Another source of wealth is the fertile soil of the wooded steppe and steppe zones. These zones are the most exploited and densely populated parts of Siberia. In recent years the virgin and long-fallow lands of these parts have been rapidly brought under cultivation.

Siberia is rich in fauna. Many varieties of animals are trapped. Siberia is famous for its lovely furs—sables, fox and squirrel.

The national composition of Siberia is highly varied. In the north live Nentsi, Khanty, Evenki, Chukchi and Koryaks. These peoples are engaged mainly in hunting, reindeer-breeding and fishing. One of the most numerous people of Siberia are the Yakuts. In the southern parts of Siberia live the Khakassi, Tuva and Buryat peoples. They are mainly engaged in cattle-breeding.

However, the main population of Siberia is Russian. The Russians came to this land at the end of the 16th century. It took them only fifty years to cross the whole of this vast, unknown and forbidding land to the Pacific Ocean itself. In the van moved the Cossacks—the fur traders. Then came servicemen and peasants. In three centuries of persevering work the Russians gradually mastered the thinly-populated Siberian land. In the south they ploughed the steppe, built villages and towns, laid roads. It was no easy task to master grim, though rich, Nature, but freedom from the conditions of serfdom trained a hardened, strong-willed type of Siberian—a man who was used to fending for himself and to overcoming all obstacles.

However, up to the very Revolution, Siberia remained an out-of-the-way region. The tsarist regime placed fetters on the creative forces of the people. The forest trees rotted unfelled. The mineral wealth either remained unprospected or was exploited in a predatory manner. There were practically no factories in the towns. Only agriculture and dairy-farming reached a high level of development in the southern part of Western Siberia.

The October Revolution changed Siberia into a new land and endowed its men and women with new energy.

Southern Siberia began to give the country, besides grain and butter, large quantities of coal, steel and machinery, the north, besides furs and gold, gave valuable metals and sawn timber. Air lines crossed the taiga, machinery began to work at the distant mines, the hunters exchanged their flintlocks for modern guns. Through the ice along the Arctic coast a sea route was laid

The economic map of Siberia has had to be almost entirely redrawn. The old map showed no traces of the metallurgical industry in Stalinsk in the Kuzbas, of the machine-building industry of Novosibirsk, Rubtsovsk, Krasnoyarsk, and Ulan-Ude, of the sawmills in Igarka, the textile mills of Barnaul and Kansk, the orchards, the South Siberian Railway

The old towns of Siberia have grown—Omsk, Novosibirsk, Krasnoyarsk, Irkutsk, Yakutsk. And new towns have arisen—Kemerovo, Stalinsk, Igarka, Angarsk, etc

Siberian agriculture has been mechanized and collectivized.

The economic map of the Soviet Union continues to change as it reflects the co-ordinated development of all parts of the country. The central regions, where most of the population and economic power are concentrated, are growing. But the eastern regions are growing still faster, as their countless natural riches are brought into production.

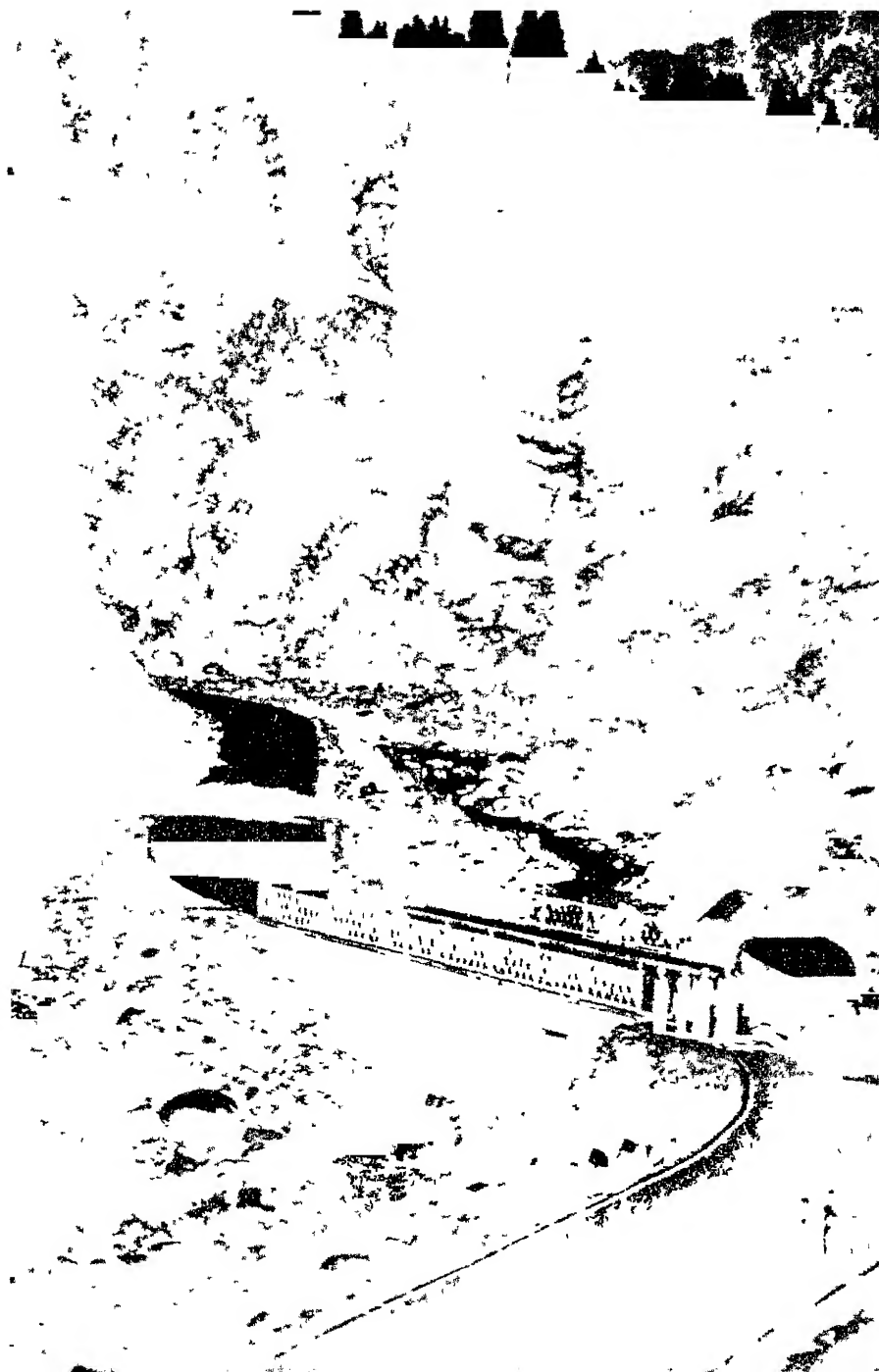
The immense development of Soviet economy calls for more and more natural resources, and most of these lie in the east. There are found three-quarters of the coal reserves, four-fifths of the electricity reserves, four-fifths of the timber reserves, and the main deposits of non-ferrous and rare metals. Moreover, these raw materials are cheaper to extract than those of the central regions

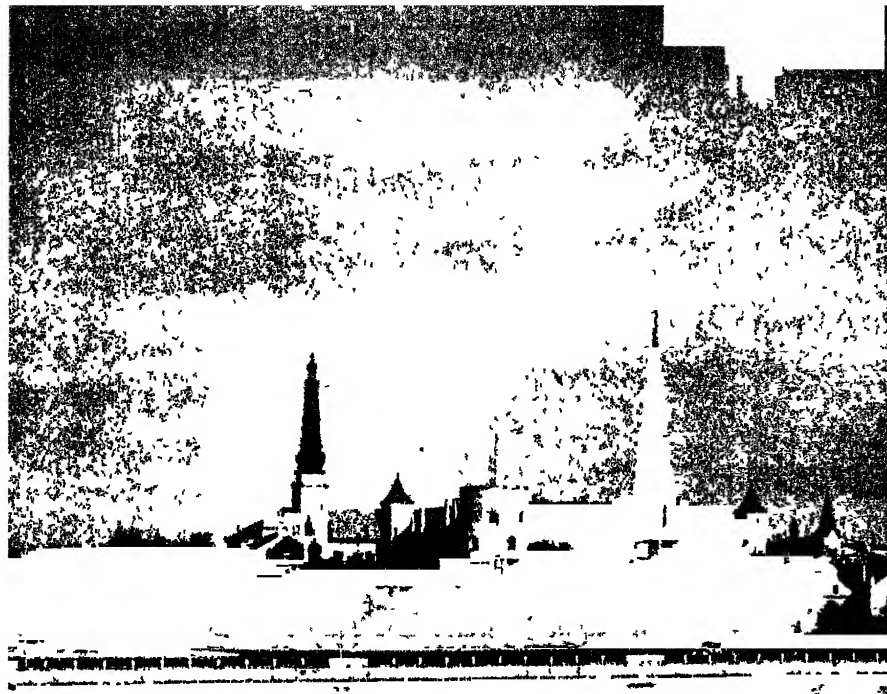
The Soviet East is above all Siberia. And it is on Siberia that the attention of all the Soviet people is fixed.

The basis of the economy of the Siberia of tomorrow is a mighty electric power industry. It is being built up mainly on coal and water-power.

New coal-fields and local deposits are being exploited, and it is worth noting that almost everywhere Siberian coal can be extracted

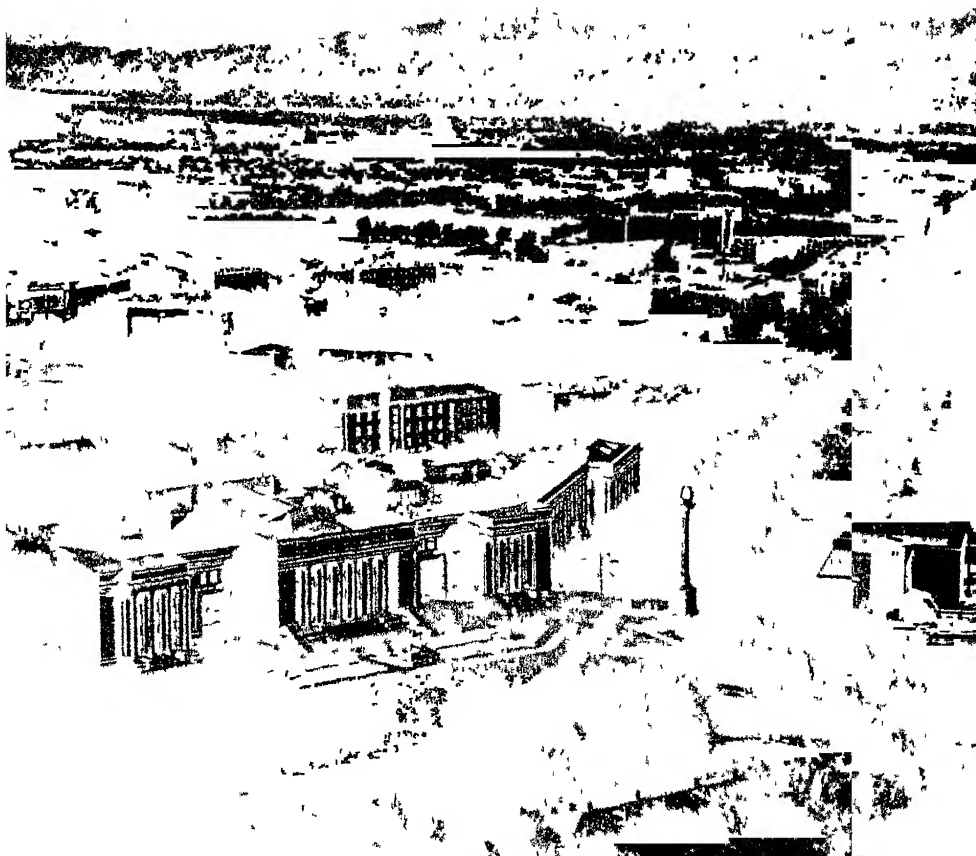
In the Tien Shan Mountains, Southern Kazakhstan







Riga, capital of Latvia



Dushanbe, capital of Tajikistan

from open-cast workings, which makes Siberian coal the cheapest in the land. Very large power stations are now being built to work on coal, and gigantic hydropower stations are rising on the great Siberian rivers.

When the power stations that are now being built there are commissioned, Siberia will produce more electricity than any country in Western Europe

The abundant sources of power, the combining of the ramifications of the electricity network, are laying the foundations of a complex of heavy industry enterprises, among them some which used a great deal of power. In the near future Siberia will be changed into the main base of those branches of industry which consume much power and heat, such as the production of aluminium. Electric metallurgy will be introduced there.

Vast deposits of iron ore and coking coal have been found in Siberia. They form the basis of heavy metallurgy. At the present time the U.S.S.R.'s third metallurgical base is being built up there. Two large metallurgical works are already under construction.

On the basis of metal a powerful machine-building industry is growing. In the near future Siberia will build dozens of machine-building works. Besides, it is establishing non-ferrous metallurgical works, and oil-refining, timber and timber-processing, light and food industries. In Yakutia one of the biggest diamond fields in the world is being opened up.

Millions of hands are required if the mighty economic forces of Siberia are to be set in motion. But Siberia has relatively few inhabitants. Siberia must be settled. To hasten this process, to place the planned upsurge of Siberia on to a basis of reality, the state appealed to the public, in the first place to the youth, to go and work in that very rich land, to settle there, to give Siberia their labour.

The youth responded warmly to this appeal and went to the East.

In a short time Siberia will be turned into a first-class industrial region of world significance.

THE UKRAINE

[Area: 601,000 square kilometres. Population: 41,900,000]

The Ukrainian Soviet Socialist Republic is situated in the southwest of the U.S.S.R., north of the Black Sea. Excluding the Russian Federation, the Ukraine is in area the biggest state in Europe. It is larger than France.

The Ukrainians are one of the most numerous Slav peoples. They have a rich history and a high level of culture. They are closely related to the Russian people.

Ukrainian national poetry and music, especially the lyrical, emotional folk-songs, are outstandingly beautiful. Ukrainian ornamentation, especially costume embroidery, is widely known for its original beauty.

The boundless steppe. The field roads glossy from the rich, fatty chernozem. The wheat turning golden in the fields, the green of the sugar-beet. Yellow circles of sunflowers hanging over the hurdles. Soaring Lombardy poplars. That is the scenery of the Ukrainian countryside. And amidst the countryside are great factories and mines, asphalted highways, railways, towns.

The nature of the Ukraine is exceptionally rich. The soil of the Ukrainian steppe is highly fertile, consisting of chernozem, which in warm climatic conditions renders a high yield. And under the soil lies much coal, iron ore, manganese and other minerals.

Yet despite this remarkable abundance of natural wealth the Ukraine was before the Revolution a generally backward land. Its extraction industry was mainly in the hands of foreigners.

In Soviet times a first-rate many-sided industry has been built up in the Ukraine. Before the Second World War the Ukraine gave the U.S.S.R. half its coal, about two-thirds of its pig iron, a sixth of its machinery, and about three-quarters of its sugar.

The Ukraine was devastated by the German invaders but at the present time its national economy has not only reached the pre-war level—it has far surpassed it.

The most highly industrialized part of the Ukraine is the Donets Basin—the Donbas—of which we have written above. In intensity of industry it is comparable with the Ruhr. Everywhere one sees the colliery head gears with their spinning pulleys, and great waste-heaps rising cone-like, the long spreading buildings of engineering plants and chemical works; big metallurgical works, tongues of flame leaping over the furnaces, clouds of smoke, railway tracks, interlacing wire, thundering machines. .

Machine-building is highly developed in the Ukraine. In spite of the tremendous amount of destruction caused by the German invaders there are today more machine-building works than before the war.

The machine-building industry of Kharkov, for example, totally destroyed during the war, has long been restored. Kharkov produces tractors, turbo-generators, diesel locomotives, machine tools and bicycles.

The industry of the Ukraine, in common with that of the Soviet Union as a whole, is based on a strong foundation of electric power. There are many large power stations, including those on the Dnieper.

The Ukraine is one of the principal agricultural granaries of the Soviet Union. The productivity of the Ukraine's arable land is higher than that of the United States on a reckoning of the yield of the main crops per 100 hectares.

Some of the northern areas of the republic fall within the forest belt, there rye, wheat and buckwheat are grown.

Farther to the south lies the most densely populated agricultural zone—the chernozem wooded steppe which is better provided with warmth and moisture than any other part of the chernozem belt in the U.S.S.R. This is a region of wheat and sugar-beet, of highly-productive animal husbandry.

Still farther south lies the steppe proper, at first with chernozem and then, as it runs closer to the Black Sea, with chestnut soil. This is a region of wheat, barley and non-irrigated cotton fields.

Throughout the Ukraine the villages are in process of transformation. Many architects and engineers are working on village planning.

The traditional Ukrainian *khata*—an adobe cottage with thatched roof, earthen floor and small windows, now belongs to the past. It is being replaced by houses of two, three or four rooms, with tiled roof, veranda, electricity.

Schools, clubs, cinemas, hospitals, canteens, broadcasting centres, sports stadiums, telephone exchanges, public baths, laundries—all these are being built in the countryside.

The capital of the Ukraine is Kiev. Kiev is one of the most ancient, beautiful and highly civilized cities of the Soviet Union. A thousand years ago it was the capital of the Kiev Rus—a powerful Slav state bounded by the Black Sea, the Carpathians and the Volga. Here Russia adopted Christianity. Out of the unified Kiev Rus Slavdom subsequently divided into three fraternal branches—the Russian, Ukrainian, and Byelorussian.

Kiev stands on the high hills of the right bank of the Dnieper but has spilled over on to the left bank too. Orchards and gardens lie between the buildings on the hill slopes. From the tops of the hills you look down on to the sandy beach of Trukhanov Island beyond which stretch the broad flood-meadows of the Dnieper Valley, bounded in the distance by a wall of pine woods. The banks of the Dnieper are lined with granite. Chestnuts grow along the embankments.

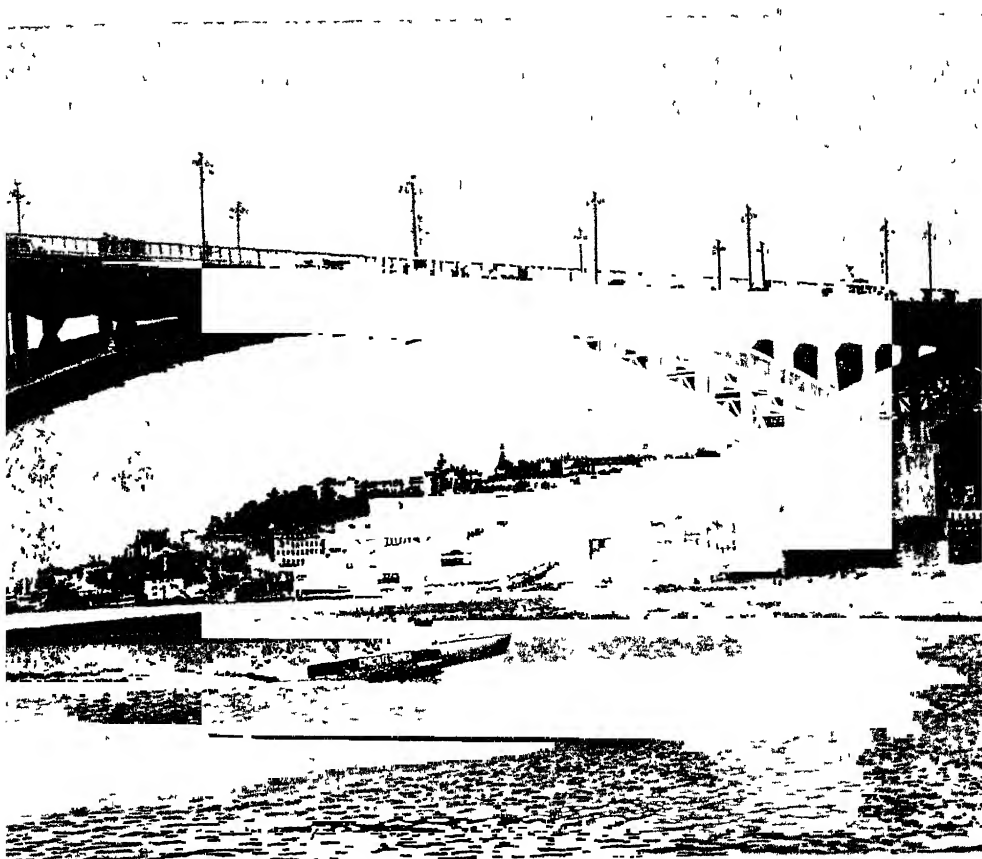
Kiev has many splendid buildings. New factories have sprung up. As well as being the principal centre of the Ukraine's light industry, Kiev has its heavy industry too. The Nazi invaders inflicted terrible devastation. Whole streets, especially in the centre of the city, were left in ruins. On the main street, the Kreshchatik, only a few buildings remained intact. Poplars and chestnuts were uprooted.

Now Kiev has been rebuilt. It has become more beautiful than ever. The Kreshchatik has been doubled in width, large buildings have arisen, young trees have been planted. The old bridges over the Dnieper have been rebuilt and new ones erected. A big open-air theatre has been built in the hills above the river. A park has been laid out on the left bank.

Kiev is an example of the extensive building that is under way in the Ukraine. Housing construction in all the towns and cities of

The ancient Kremlin, Novgorod





A bridge across the Oka near its confluence with the Volga. On the hill—the Kremlin of the city of Gorky

the republic is constantly increasing in scale and tempo—during the Seven-Year Plan 100,000,000 square metres of new floor space are to be provided, which is two and a half times more than was built in the previous seven years.

Kiev is the main centre of Ukrainian culture

Before the Revolution the Ukraine had no scientific research institutions in the modern sense. By the outbreak of the Second World War it had 300. And now it has even more. They are situated in Kiev, Odessa, Dnepropetrovsk, Stalino, Kharkov and other towns. There is an Academy of Sciences of the Ukrainian Republic, situated in Kiev. The number of institutions of higher learning increased from 27 in 1914 to 138 in 1957.

During the Seven-Year Plan the Ukraine will take new strides forward in the cultural field. For example, some twenty more scientific research institutions are to be created under the auspices of the Academy of Sciences. They will include institutes of semi-conductors, physics and mathematics, biophysics, geophysics, law, folk art, etc. The construction of a nuclear reactor is approaching completion.

The German invaders burned and destroyed practically all urban and rural schools in the Ukraine. Now the republic has more schools than before the invasion.

There are more students today in the Ukraine than before the war. In the institutes of Kharkov alone 77,000 students are studying.

The Crimea lies within the frontiers of the Ukrainian Republic. It forms a peninsula linked to the mainland by a narrow isthmus. The Crimea consists of steppeland with a range of mountains in the south, whose slopes run steeply down to the sea. These mountains shelter the southern shores of the Crimea from the north winds. Beside the warm waves rise slender cypresses, orchards blossom and grapes ripen. Thousands of people visit the Crimean coast for rest and medical treatment. Here is located the beautiful Pioneer Camp Artek, known to the children of many countries of the world.

During the Seven-Year Plan the economy of the Ukraine will continue to develop rapidly. The republic's gross industrial production

is to rise by about 77 per cent. In particular the iron-ore base will be strengthened, and several large ore-concentrating mills will be built. Many new collieries will be established and old ones reconstructed. The chemicals industry is marked for substantial expansion. Machine-building, in particular, the production of automobiles, is to be developed.

The production of consumer goods will be considerably increased. Large textile mills are to be built. The output of furniture is being doubled. Various kinds of agricultural produce will be put out in much greater quantities.

As a result of the work envisaged in the Seven-Year Plan, Soviet Ukraine will substantially surpass the most highly developed industrial lands of the West in per capita production of a number of industrial items. Thus, in pig-iron production the Ukraine will in 1965 have surpassed the 1957 per capita production figure in the United States by about 70 per cent, the West German figure by 90 per cent, and the British and French figures by 150 per cent; in steel production the 1957 figure for the U.S.A. will have been surpassed by about 20 per cent, for West Germany by 40 per cent, for Britain by 60 per cent, for France by 120 per cent; in electricity per capita production in the Ukraine will be higher than that in West Germany and France.

Industry in the more backward western regions of the Ukraine is advancing rapidly. Near Lvov, for example, chemicals and coal industries are springing up, and the output of existing enterprises is increasing considerably.

BYELORUSSIA

[Area: 208,000 square kilometres. Population: 8,000,000]

The Byelorussian Republic lies on the western borders of the U.S.S.R. Byelorussia is a large, highly developed Slav state. In area it is a little smaller than Britain. Both in population and economic strength Byelorussia occupies one of the leading places in the U.S.S.R.

The relief of the country is of glacial character, with constantly undulating, gently sloping hills—the eroded sediment of ancient moraines. Here and there are lakes and marshes. There are stretches of forest, some coniferous, some mixed, with pines and firs among the aspen, maple, lime and hornbeam. The woods alternate with arable land. In the fields are seen waving rye and wheat and a greenish-blue carpet of flax.

Byelorussia had almost no industry before the Revolution, but during the five-year plans a large-scale one was built up. Its factories produce plywood, matches and paper out of local timber, linen out of flax, footwear out of local leather, and glass from quartz sand. Machine-building, garment, and knitting industries have been established.

The former artisans of Byelorussia were drawn into work in these enterprises, together with newly-trained personnel. In the past their skilful hands were often unemployed.

In proportion to the population Byelorussia produces more metal-cutting lathes than France and Japan, in per capita production of leather footwear Byelorussia leads West Germany, Denmark, Norway, Finland, France and Sweden. Byelorussian products are exported to more than thirty foreign countries.

Minsk, the capital, is the main industrial centre. When the Germans retreated they turned this city into a heap of rubble. Now Minsk has been rebuilt.

The first thing that catches your eye when you enter Minsk is the new buildings. A new railway station has been erected. There are big new constructions on the station square. Not far from the station the University hostel has been rebuilt.

Farther on runs a beautiful broad avenue, the axis of the city. It has been completely rebuilt. It is lined with new buildings—a big apartment house for textile workers, several for machine-builders and cultural workers, a huge department store and many others. Minsk's industries already produce considerably more than on the outbreak of the Second World War.

Besides the restoration of old factories, new ones have been built in Minsk

On the outskirts of the city where in tsarist days stood roadside taverns and the forest stretched, a new machine-building suburb has arisen. Bicycle, automobile and tractor works have been erected there. Houses of urban type have been built near the factories. This suburb is itself a town

In Minsk light industry used to predominate before the war; now machine-building has the preponderance.

Industry is developing in other Byelorussian towns, too. Gomel, for instance, has become a large industrial centre. It makes machine tools, agricultural machinery, river vessels and glass. Vitebsk, Orsha, Mogilev and Borisov give much industrial production.

During the Seven-Year Plan, capital investment in the Byelorussian economy will more than double the investments during the previous seven years. All branches of production will benefit; an oil-refining industry and a chemicals industry will be introduced. Many new enterprises will be erected in the western regions of the republic which had a low level of industry in the past.

As a result of the fulfilment of the Seven-Year Plan, Byelorussia will provide the Soviet Union with more than 20 per cent of its potash fertilizer, 9 per cent of its metal-cutting lathes, 18 per cent of its tractors. These figures indicate the scale of the economic development of this once-backward land.

In the collective and state farms of Byelorussia flax is sown, potatoes are planted, pigs are raised. All these branches of farming are developing rapidly.

The Byelorussian village is changing in appearance. When you travel about the republic you see newly-built houses everywhere. Only ashes were left when the German invaders were driven out.

Byelorussian culture continues to develop.

Before the Revolution there were no institutions of higher learning in Byelorussia. There are about thirty now.

All the scientific research institutes of the Byelorussian Academy of Sciences were reopened after the expulsion of the invaders, and

new ones founded Byelorussian scientists are working on questions of economics, history, philosophy, literature, chemistry and medicine. They have a Byelorussian dictionary of 80,000 words, have written the history of their country and of its literature, and have compiled a many-volume description of Byelorussian flora.

Byelorussia has at present twenty-five higher education institutions. This fact can be fully appreciated only when it is taken into account that before the Revolution over 80 per cent of the population of Byelorussia were illiterate and there were no higher education institutions.

The number of pupils attending schools and higher education institutions per 10,000 inhabitants in Byelorussia is greater than in such lands as Britain, France, Italy and Sweden.

Before the Revolution Byelorussia published each year one book for roughly every twenty-five inhabitants. In 1958 Byelorussian publishing houses issued about two books per head of population.

The great range of cultural and industrial construction corresponds to the international significance of the Byelorussian Soviet Republic.

KAZAKHSTAN

[Area: 2,756,000 square kilometres. Population: 9,300,000]

In area the Kazakh Republic is second only to the Russian Federation among the constituent republics of the Soviet Union.

Kazakhstan stretches from the Caspian Sea on the west to the Altai on the east, from the Trans-Siberian Railway on the north to the plains of Central Asia on the south.

Most of Kazakhstan lies on treeless plain but the central part is very hilly. The climate is generally arid, with hot summers.

In the north, where there is more rainfall, there are expanses of chernozem steppe. Here wheat is grown over a large area which has been greatly expanded in recent years. Over 20,000,000 hectares of virgin and long-fallow land has been brought under the plough.

within the past few years Kazakhstan is second only to the R S F S.R. as a source of grain

Towards the south precipitation decreases, the woods disappear entirely, the soil becomes lighter and turns grey. There are large areas of saline, sandy or clayey land. This is the desert zone.

The principal branch of farming practised in central Kazakhstan is sheep-raising.

In tsarist days the Kazakhs were constantly changing their grazing-grounds and moving from place to place. This nomadic life, which affected the whole people, was very arduous. Nature held people enslaved, a crust of ice would form over the land and there would be a shortage of fodder followed by the murrain.

Nowadays too the sheep are driven from one grazing-ground to another, but everything is organized in a different way than before.

The Kazakhs have settled down. They have built hundreds of villages with comfortable homes, schools, vegetable gardens—things that were unknown to them during their constant nomadic wanderings. The sheep and cattle are driven along routes which have been established on scientific principles. Vets and zoo-technicians accompany the herdsmen and shepherds. To meet the eventuality of winter fodder shortages the collective farms prepare fodder stocks. The sheep are sheared electrically, the cows milked mechanically. Pens are built to protect the herds from the winter cold. On remote grazing-grounds inter-kolkhoz centres with living quarters and cultural amenities are built.

Kazakhstan is one of the main bases of animal husbandry in the U S S.R. The herds and flocks of its collective and state farms provide large quantities of wool, meat and hides.

In the extreme south of the republic where the desert adjoins high mountains rainfall is slight, but the rivers flowing down from the mountains form fertile oases like those of Central Asia.

The soil is so fertile in these oases that in five years a poplar grows into a tall tree and already provides shade, while the fields can, with the appropriate crop rotation, yield two harvests a year.

Here valuable crops like cotton, sugar-beet and oil-bearing plants are grown

During the Seven-Year Plan the agricultural production of Kazakhstan is to continue expanding. For example, the production of sugar-beet is to increase by 90-120 per cent, of meat by 150 per cent, of wool by 110 per cent. Work will go on to bring more land under the plough, to raise yields and irrigate grazing-grounds.

In tsarist days there was practically no industry in Kazakhstan. It was a backward agrarian region. During the pre-war five-year plans Kazakhstan built up important meat, hide, sugar and fruit-canning industries, i.e., industries based on the processing of agricultural produce.

But of particular importance to Kazakhstan are the industries connected with the extracting of minerals.

Kazakhstan is exceptionally rich in minerals. Millions of years ago the mountains that used to lie in the middle of Kazakhstan were demolished and turned into low knolls. During the process the valuable ores they concealed were exposed. In this respect Kazakhstan resembles the Urals. There are hardly any chemical elements which cannot be found in Kazakhstan.

At a number of works in central Kazakhstan copper is smelted. Lead is mined in the south of the republic. A number of other metals important for the national economy are extracted in Kazakhstan. There are also gold-fields.

Kazakhstan is very well supplied with mineral fuel too.

One of the Soviet Union's most important coal-fields lies within the borders of Kazakhstan—at Karaganda. This rich coal-bearing area was prospected and exploited only since the Revolution. Now there are many large collieries there. The town of Karaganda has arisen. Where but recently the desert stretched we now find big houses, orchards and scientific institutions. Ferrous metallurgy is being developed near Karaganda.

Open-cast coal mining is carried out in several places in the republic. The most important of these is at Ekibastuz.

Kazakhstan now has its own machine-building industry.

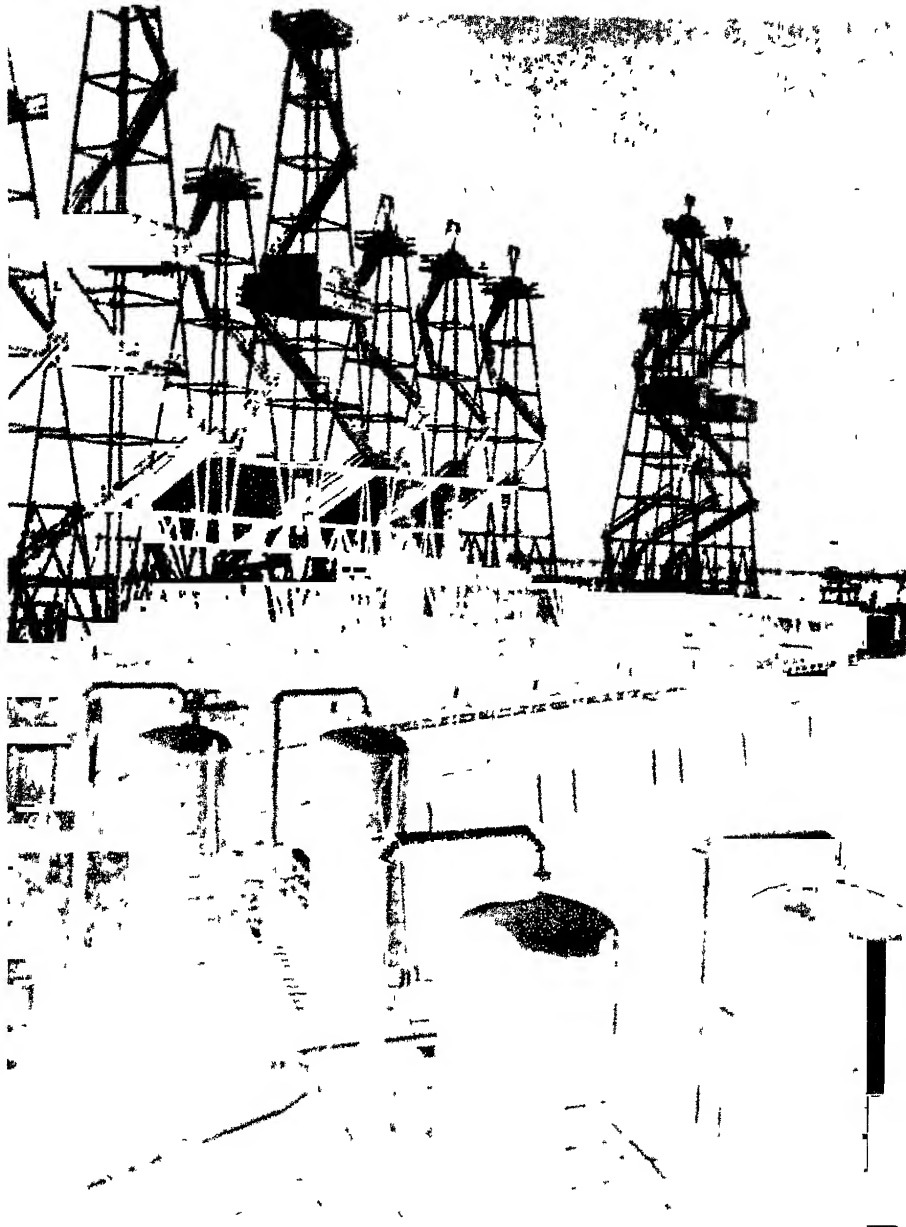
During the Seven-Year Plan the gross industrial production of Kazakhstan is to be increased by about 170 per cent. It is planned to expand the production of the non-ferrous metallurgical, electrical, machine-building, chemicals, oil, coal, cement, food-processing and light industries. There is to be much new construction in the ferrous metallurgical industry. For the first time in its history Kazakhstan will make its own pig iron at the new Karaganda works. At Sokolovka-Sarbai will be opened the Soviet Union's biggest combine for extracting and enriching iron ore. This will supply ore to the growing heavy metallurgical industry of the Urals and to Kazakhstan's own metallurgical works. Machine-building is to be expanded. Kazakhstan will, for instance, make its first electric motors, electro vacuum equipment and cables. Coal production is to be expanded by 50-60 per cent. The production of artificial fibres is to increase tenfold.

The capital of Kazakhstan is Alma-Ata, a large city with a high level of cultural development situated at the foot of the Tien-Shan Mountains. Snow-clad peaks rise above the city. During the day the distant snow glitters in the rays of the sun, and in the evening, after sunset when darkness has fallen over Alma-Ata, the snow glows with a tender reddish light.

The sides of the mountains are clothed in forests of conifers. They are about 20 kilometres away from the city. But there are bright, transparent hours when you seem to be able to distinguish every fir-tree from the streets of Alma-Ata.

Lower down, quite near the city, the foot-hills undulate. Their tops are bare but their feet drop into apple orchards. In early May, when the orchards are pink and white and the air is redolent with the scent of apple blossom, and in late September, when the apples lie heaped up under the trees, you have no difficulty in understanding why the city bears the name of the "father of the apple" (alma—apple, ata—father).

At Alma-Ata the Kazakhstan Academy of Sciences with many institutes, including an institute of nuclear physics, has been founded. There are several institutions of higher learning, including the Ka-



Oil wells on the Caspian



Vilnius, capital of Lithuania

zakh University, and a fine opera and ballet theatre which stands against a background of mountains in such a way that you have the impression that the snow-clad peaks have been included in its architectural design

UZBEKISTAN

[Area: 409,000 square kilometres. Population: 8,100,000]

The Uzbek Republic lies in the middle of Central Asia. Its southern border is contiguous with Afghanistan.

In addition to the Uzbeks, who constitute the majority of the population, there is a compact mass of Kara-Kalpaks in the republic. They form the Autonomous Republic of Kara-Kalpakia (capital Nukus) within the Uzbek S S R.

Many Uzbek men wear white robes cut low to expose a sunburned chest, and black *tiubeteiki* (skull-caps) with white patterns. The women wear multi-coloured dresses, shot with pale yellow and red patches. The girls' black locks are plaited in dozens of braids.

This is what the country districts of Uzbekistan look like: in summer the weather is extremely hot. Along the rippling irrigation canals mulberry-trees and Lombardy poplars grow in straight lines. At the roadside stand isolated *karagach*-trees, leafy trees like dark green globes. Behind clay walls stretch vineyards and orchards. Out of the water, retained by little barriers of earth, stick stems of rice. Fields of alfalfa lie green in the sunshine.

But the main crop is cotton.

Uzbekistan gives more cotton than all the other Soviet Central Asian republics together. About three-fifths of all Soviet cotton is picked in Uzbekistan. In 1958, for example, over 3,000,000 tons of cotton were picked there.

Uzbekistan now produces as much cotton as such cotton-producing lands as Brazil, Pakistan, Turkey and Iran together.

Since the Revolution the cotton crop in Uzbekistan has increased by five and a half times. Large expanses of new land have been irrigated. Many new canals and cotton fields have been reclaimed, for

example, from the Golodnaya (Hungry) Steppe Cotton growing and those branches of industry connected with it are to expand rapidly during the Seven-Year Plan, too. Large-scale irrigation work will be conducted.

Uzbekistan also has non-irrigated deserts where the valuable karakul sheep is raised. Grain crops are grown on non-irrigated land on the mountain slopes. But the majority of the population lives in the cotton-growing oases.

Before the Revolution, Uzbekistan had no industries, not counting the small cotton-ginning works. The ginned cotton was shipped in entirety to the mills of Central Russia. Now Uzbekistan has its own large-scale textile industry. A portion of the Uzbek cotton crops is now used locally—in Tashkent, Ferghana, Kokand. Uzbekistan's new large mills produce silk, its factories make cotton-seed oil, canned fruit, produce wine.

Soviet Uzbekistan has its heavy industry as well: in the Ferghana Valley oil and sulphur are extracted, coal is mined near Tashkent, and in Tashkent itself various types of machinery are made. Outside Tashkent there is a large electrochemical combine producing nitric fertilizers.

Uzbekistan's heavy industry has taken especially rapid strides in recent years. A diversified machine-building industry has been established there, the extraction of valuable ores has expanded, and power stations have been built. Central Asia's first ferrous metal works have been built, where steel is already being made.

At the present time Uzbekistan has over 1,300 large industrial enterprises and more than 70 branches of industrial production.

The gross industrial product in Uzbekistan is to increase by 80 per cent during the Seven-Year Plan: for the first time the republic will get a large-scale gas industry, connected with the discovery of the biggest deposit of natural gas in the Soviet Union—at Gazlı near Bukhara. This source of natural gas in Uzbekistan will supply not only a large part of Central Asia but also the major industrial centres of the Urals by means of new pipelines.

Uzbekistan is the largest of the Soviet Central Asian republics,

and its capital, Tashkent, is the largest city in Central Asia. It lies amidst orchards on the irrigation canals fed by the River Chirchik which runs down from the mountains and flows into the Syr-Darya. Tashkent is an important industrial and cultural centre.

In tsarist times the literary rate among the Uzbeks was less than 2 per cent. And these 2 per cent were made up of the beys and merchants. Now illiteracy has been totally wiped out in Soviet Uzbekistan.

At present the number of specialists with higher education per 10,000 of the population in Uzbekistan is twice as large as in France, seven times as in Turkey, 28 times as in Iran. There is an Uzbek Academy of Sciences. Uzbekistan has an institute of nuclear physics and an atomic reactor.

There was only one newspaper in the Uzbek language before the Revolution, in Uzbekistan today 227 newspapers are published, of which 162 are in the Uzbek or Kara-Kalpak language.

Uzbek women were deprived of all rights in the past. They were sold like chattels, they lived on the droppings from their husband's tables, they could venture outside only if they veiled their faces with the *chachvan*, made of black horsehair. In Soviet Uzbekistan women are free. Bride purchase and polygamy are forbidden by law and have become obsolete. Among the Uzbek women we find many advanced workers, teachers, engineers, factory managers and deputies of the Soviets.

GEORGIA

[Area: 70,000 square kilometres. Population: 4,000,000]

The Georgian Republic lies in the Caucasus, almost entirely on the southern side of the Main Caucasian Range. On the west it touches the shores of the Black Sea, on the south it is contiguous with Turkey.

In addition to the Georgians—the principal inhabitants—the population is composed of Abkhazians, who live in the Abkhazian Autonomous Republic (capital Sukhumi), and of Adjarians, who inhabit the Adjar Autonomous Republic (capital Batumi).

Georgia is a land of an unusually rich, beautiful and highly-varied nature. On the coast of the Black Sea there is a belt of humid subtropical country. Further from the sea are valleys with a drier climate. Still higher the slopes of the mountains are perpetually snow-clad.

In appearance Georgia is many-faceted and vivid. Palms grow on the banks of rivers that spring in mountain glaciers. Grim rock alternates with soil on which a subtropical flora grows. Stretches of land baked by the sun lie close to damp scrub. The electric train cuts across mule tracks. Beside the ruins of ancient feudal castles rise modern power stations.

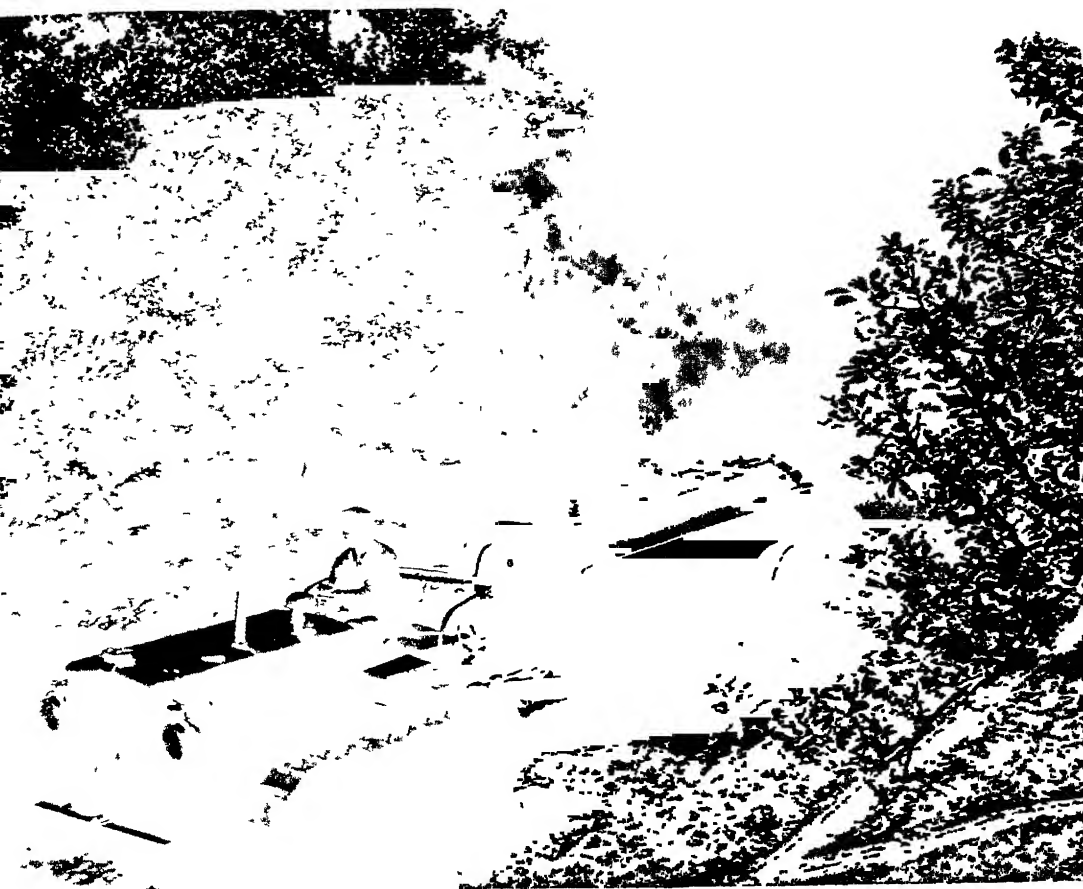
In the valleys of Georgia, as throughout the Caucasus, the mountain dwellers have preserved their original costumes. a trim Circassian tunic reaching to the knees with silver-clasped cartridge cases on the chest, a dagger at the belt, soft high-boots, a flat sheep-skin hat, a *bashlyk* (cape) over the shoulders.

The Georgian people have created a fine culture. The Georgians are mentioned in the cuneiforms of ancient Assyria. The great Georgian poet, Shota Rustaveli asserted the idea of humanism in his works long before the bards of the European Renaissance.

The Georgians preserved their culture through centuries during which they were constantly fighting hard for their freedom. They strove bravely and staunchly for independence against Romans and Arabs, Mongols, Persians and Turks. By her unification with Russia 150 years ago Georgia saved herself from enslavement.

The October Revolution gave the Georgian people the opportunity to develop their creative powers boundlessly. In a country where there used to be one wooden plough between every three households mechanized, advanced agricultural methods were introduced. The whole of the Soviet Union benefits from this leap forward, for it receives from Georgia increasing quantities of tea, oranges, lemons, tangerines, grapes and tobacco. Georgia also produces wheat and wool, but it is her subtropical produce that is Georgia's main contribution to the economy of the U S S R.

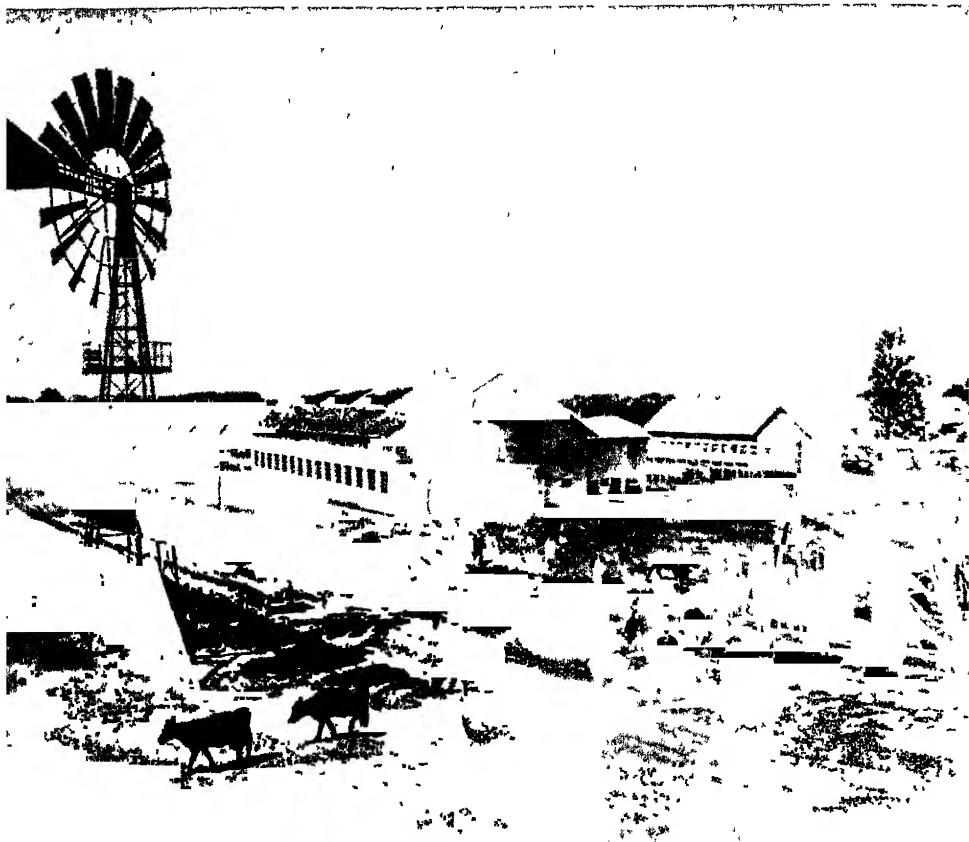
The Black Sea coast of Georgia is shielded by mountains from the



Fruit orchards in Moldavia



Tbilisi, capital of Georgia



A collective farm in Latvia

cold winds. Here the summers are hot and, what is still more important, the winters are very mild. In Batumi the mean January temperature, the coldest month of the year, is 6.5°C above zero.

The dense deciduous woods are entangled with lianas. There is an abundance of ferns—during the summer they grow to the height of a man. It takes but two or three years for a grove of tall alders to grow on red soils.

In tsarist days maize was grown in these fertile regions but tea, lemons, tangerines and essential oils were imported by Russia from abroad.

An important subtropical industry has been built up in Soviet Georgia.

Wherever you look, in the valleys or on the hill slopes you will see even lines of growing crops.

The mountain slopes look as if they have been corrugated. The terraces are planted with the silvery-green spherical shaped clipped tea bushes. Over the bushes lean men and women in broad-brimmed straw hats.

And here are trees with glossy leaves. Amidst the green a glitter of yellow or orange spots. These are plantations of lemons, oranges, tangerines and grape-fruit. A grove of cork-oak. A field of essential oil-bearing plants. A plantation of tung which yields a valuable industrial oil.

Georgia's subtropical agriculture continues to expand. For example, tea production is to rise by 60 per cent by 1965. Fifteen new tea factories are to be built. The grape harvest is to be almost doubled, and the production of the fine Georgian wines will be increased.

But it is not only agriculture that is on the upgrade in Georgia. An advanced, rapidly expanding industry has been established there. Now Georgia provides not only wine and cloth, and the manganese ore and coal of its mines, as it did before the war, it makes fertilizers, pig iron and steel, and builds motor trucks. Large power stations have been built on the mountain rivers.

All these branches of industry are to expand still more during the Seven-Year Plan. Industrial production is to grow by almost

75 per cent The electricity supply is to be increased—in particular, a large power station is being built to use natural gas as fuel; in the machine-building industry the greatest progress is to take place in instrument-making and electrical equipment manufacture, a large number of diesel locomotives will be built. Chemicals production is to rise sixfold.

Tbilisi, the capital of Georgia, lies in a broad valley framed with mountain slopes The turbid River Kura flows through the city in a deep bed Along the horizon runs the well-defined, broken line of the distant mountains The eye picks out a ruined fortress, the sharp conical tops of Georgian church towers—traces of the past. Tbilisi is 1,500 years old It is one of the most ancient cities of the world. Old Tbilisi is lost amidst the modern quarters with their majestic avenues and streets, their abundant tall buildings

The capital of Georgia has become an important industrial centre. Tbilisi produces intricate machinery for the factories of Transcaucasia, and also footwear and cloth

The Georgian Academy of Sciences is studying the riches of the land and helping the fulfilment of the national economic plans. Thousands of students study in institutions of higher learning Tbilisi has some excellent theatres

AZERBAIJAN

[Area: 87,000 square kilometres. Population: 3,700,000]

The Azerbaijan Republic is situated in the Caucasus along the shores of the Caspian Sea.

Azerbaijan's greatest riches are her oilfields Even today new gushers of oil break through the earth, although oil has been extracted at Baku for over 70 years

In Soviet times big new oilfields have been tapped around Baku A start was made in extracting oil from the bed of the Caspian

On the Apsheron Peninsula outside Baku rise thousands of forty-metre derricks. There are so many of them that they seem to cover the whole area

Oil is not only extracted at Baku. At large refineries it is turned into kerosene, petrol, ligroine and many other products, including even perfume. Baku also makes complicated machinery, ranging from deep pumps and port cranes to wireless sets. Chemical substances and meat products are made.

Not far from Baku has risen the new town of Sumgait where oil pipes are rolled and aluminium is produced.

At Kirovabad, another town in Azerbaijan, important industries have grown up. Cotton and woollen cloth is produced at several large mills.

Azerbaijan also produces canned food, silk and wine. Fish is caught off the coast of the Caspian Sea, the valuable caviare is extracted there.

During the Seven-Year Plan, Azerbaijan's industrial product is to be almost doubled. The most important tasks facing industry are the expansion of the oil, gas, and chemicals industries, and also of the ferrous and non-ferrous metallurgical, machine-building, and textile industries.

Azerbaijan's main wealth in the field of agriculture consists of cotton, cattle, and sheep.

In the central parts of the republic lie spacious flat lands. In summer these plains are sunbaked, but in the autumn, after the rains, the grass grows again. At this time of the year large flocks of sheep and herds of horses are brought down from the summer mountain grazing-grounds to the steppes where the winter is mild, snow is rare and there is abundant pasture. Early in the summer when the hot weather sets in the sheep and horses are driven back to the mountains.

But at the place where the water, diverted from the rivers Kura and Arax along canals, crosses the plains, there is a thriving life in summertime. This is the cotton region where rice, grapes and alfalfa are also grown. The highest quality of long-staple cotton ripens there.

However, it is only quite recently that more than a relatively small proportion of the fertile but dry steppe was planted to cotton. Now

work has been set in progress that has quite changed the face of the land

The narrow gorge through which the Kura bursts before reaching the broad plains has been closed by the dam of the Mingeçaur Power Station. A new "sea" has been formed in the heart of Azerbaijan. The water runs through canals to the arid steppe and irrigates large expanses of land where cotton and wheat are now grown.

In southern Azerbaijan the narrow Lenkoran Lowlands run along the Caspian. Here the climate is hot and humid. This place used to be quite uncultivated. Now, tea, oranges and lemons are grown there on drained and cleared land. Figs and pomegranates grow in the orchards. Tea factories have been built. This is a new region of subtropical agriculture.

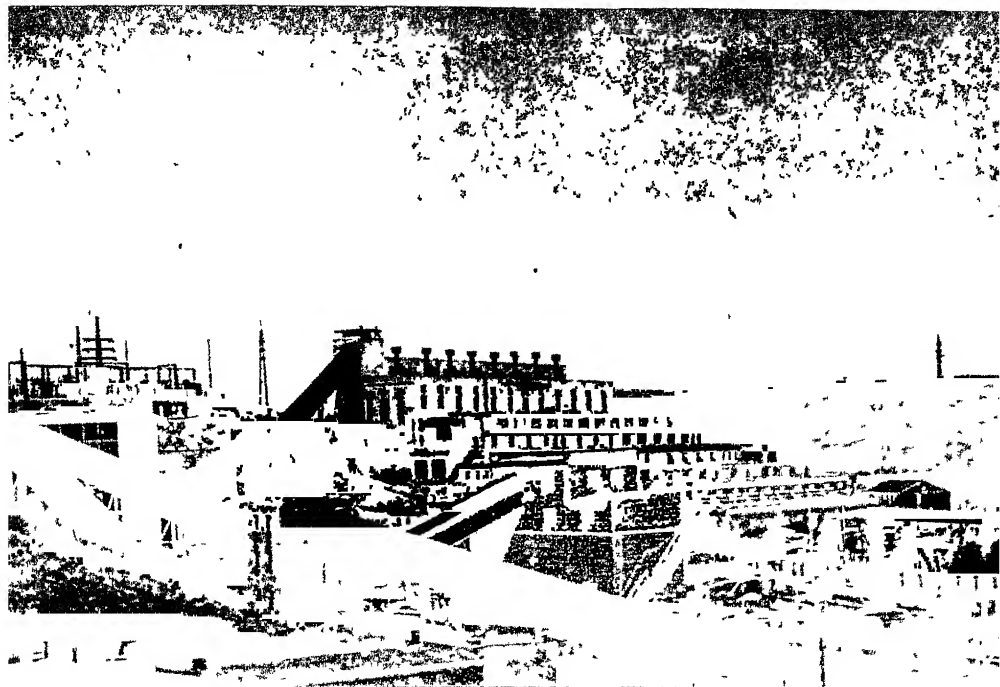
During the Seven-Year Plan, cotton-planting, animal husbandry, fruit-growing and the viniculture will continue to be greatly expanded in Azerbaijan. For example, the production of raw cotton is to be more than doubled, of meat almost doubled, and about 118,000 hectares of new orchards and vineyards will be laid out.

Baku, the capital of Azerbaijan, is one of the most highly populated cities of the Soviet Union. Since the Revolution, Baku has acquired broad avenues and many new public buildings. A museum has been founded, named after the great Azerbaijan poet and thinker Nizami, whose bronze statue stands on a pedestal of red granite. New residential districts have been built. Beautiful new dwelling-houses have arisen on the site of the smoky, poverty-stricken slums of the "Black Town"—the workers' suburbs.

In tsarist times the illiteracy rate among Azerbaijanians was 97 per cent. Now illiteracy has been totally wiped out. Baku houses the Azerbaijan Academy of Sciences. Azerbaijan has more students per 10,000 inhabitants than either Britain or France.

The Azerbaijan theatre in old Baku had no building of its own and wandered from one private house to another. Now Baku has not only several theatres but a theatrical institute as well.

The women of Azerbaijan enjoyed no rights in the past and had to wear the black *chadra*, from below which they peeped at the world.



The Achisai polymetal works in Southern Kazakhstan



Mechanized cotton picking in Uzbekistan

with the silent eyes of slaves. Now, among Azerbaijanian women there are many scientists, engineers, prominent business women and Party workers. Thousands of women study in the institutions of higher learning.

LITHUANIA

{Area: 65,000 square kilometres Population: 2,700,000}

The Lithuanian Republic is the most southern of the three Soviet Baltic republics. On the west the territory of Lithuania borders the Baltic coast.

The Lithuanian S S R is situated on plains. Its scenery consists of low, gently-sloping hillocks covered with woods, rivers with swampy banks, arable land sown to rye, wheat, flax and clover, and green meadows with herds of cattle.

The climate of Lithuania is milder than in the central parts of the U.S.S.R. The west winds, coming from the sea, bring frequent rain and overcast weather.

The food-processing, wood-working, leather and textile industries are important in Lithuania. Machine-building and metal-working are being steadily expanded. After the war, old enterprises were rebuilt and many new ones established, machine-building works in the first place. Lithuania now produces a good many things that were not made in the republic before the war—complex machine tools, for example.

Particular attention is being paid to creating in Lithuania a reliable fuel and electricity supply. The peat industry is growing rapidly. An electric power station is being built on the Niemen.

The process of further industrialization is to be intensified during the Seven-Year Plan. Investments in the expansion of the national economy are to be twice as large as during the previous seven years.

Until recently, agriculture has occupied a more important place than industry in the republic. Now the proportions have changed. Although Lithuania's agriculture continues to expand, the republic has acquired a comprehensive industry.

Lithuania's agricultural methods were in the main extremely backward. Now, advanced methods have been introduced, based on mechanization and a scientific approach.

Of the grain crops Lithuania grows wheat, rye, oats and maize. In addition to grain, potatoes, flax and clover are grown. There are many fruit orchards.

Animal husbandry is highly developed, especially the raising of cows and pigs.

The expansion of Lithuanian agriculture during the Seven-Year Plan is reflected in the following figures: grain production is to rise by 80 to 100 per cent, potato production by roughly 110 per cent, flax fibre production by 70 per cent, meat production by 50 per cent.

On the sea-shores in Lithuania you can see people searching for amber, the petrified resin of ancient trees, thrown up by the sea. Clad in glistening rubber suits, they wade knee-deep in the water along the coast, casting big nets.

The capital of Lithuania is the city of Vilnius. Vilnius lies amidst woods and hills on the River Neris, a tributary of the Niemen. The green of the hills surrounding the city merge with the green avenues and squares. Vilnius is an ancient centre of Lithuanian culture. It possesses many monuments of the past. Its university is one of the oldest in Europe.

Lithuania is making rapid cultural progress. An Academy of Sciences has been founded. New institutions of higher learning have been opened. Lithuania, for example, has two universities. Many books are published in the Lithuanian language.

MOLDAVIA

[Area 34,000 square kilometres. Population: 2,900,000]

The Moldavian Republic is contiguous with the Ukraine. It is situated in the south-west of the Soviet Union. In the east its territory crosses the Dniester at several places, in the west its borders run along the River Prut beyond which lies Rumania. Of all the con-

stituent republics of the U S S R , Moldavia has the densest population

Moldavia is a highly fertile land The climate is warm—the summers are hot, the winters mild

The sun shines with an even, warm light All around lie fields of maize and wheat

Moldavian villages, which are usually large, consist of white-washed adobe cottages with small gardens in front of each house. The eaves hang low and are supported by pillars, forming a veranda The windows, doors and corners are decorated with blue or green designs Many of the cottages are new During the past five years every eighth collective-farm family in Moldavia has built itself a new house

The cottage roofs are tiled, sometimes thatched with maize straw Sheds and fences are built out of maize stems, maize, indeed, plays a very important role in Moldavian life There is almost as much land under maize as under wheat

In the north, near the town of Beltsi, there is a stretch of flat or undulating treeless chernozem steppe.

Further south we find high hills covered with vineyards, and groves of oak, hornbeam, maple and ash These uplands with their deciduous woods and rich orchards are known as the Kodry

Still further south the land slopes down again and forms the flat and dry Budzhak Steppe Trees and shrubs are to be found here only near the smooth rivers, at places flooded during the seasons of high water

Broad stretches of Moldavian land are sown to grain. However, the main wealth of the republic consists in viticulture and fruit-growing, which are most highly developed along the Dniester and on the Kodry Half of all the vines have been planted during recent years

Moldavia has more vines than any other of the southern republics of the Soviet Union Here and there the tall vines with stakes driven into the ground stretch in long rows, among the leaves the green and violet grapes ripen In Moldavia the soil conditions are as favourable

for vines as they are in the famed Champagne region of France. During the Seven-Year Plan the grape crop in Moldavia is to be increased by 170 per cent, new vines will be planted over an area of about 180,000 hectares.

The vineyards alternate with orchards where apples, pears, plums and walnuts ripen.

In the southern steppe regions of Moldavia sheep and cattle are raised.

The flood-lands of the Dniester are covered with a fertile sediment brought down by the river from the Carpathian Mountains. Before Soviet times almost all this region was marshy. Along the Dniester stretched an impenetrable jungle of thick grass, reeds and trees tangled with wild vines and hops. The population dug barricades and shut off this land from the floods, and then turned it into orchards.

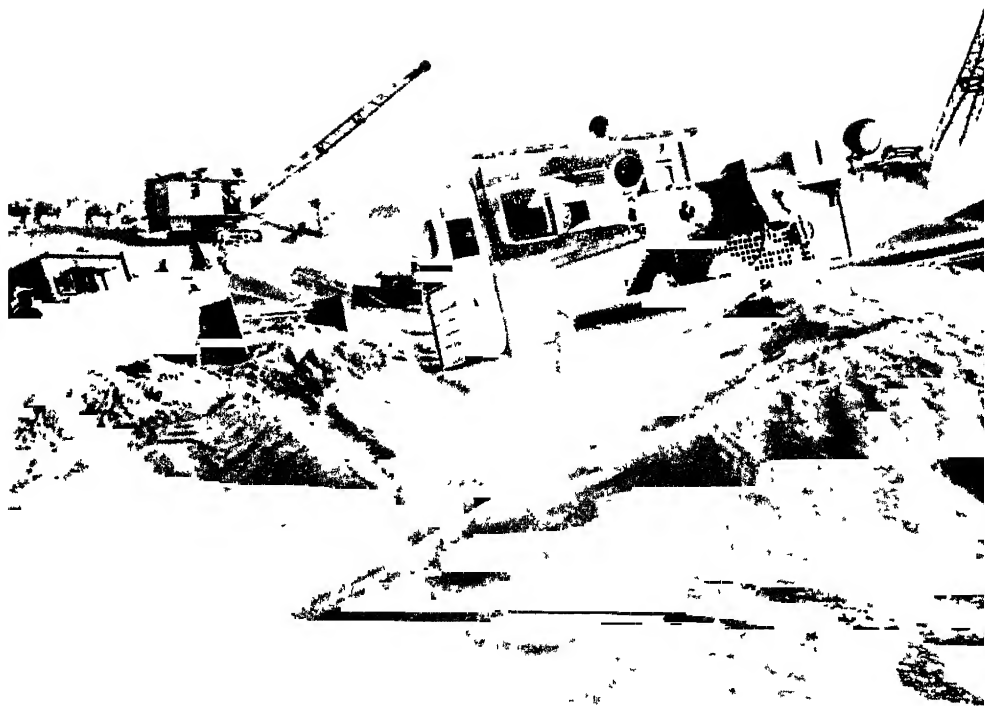
Moldavia's industry is based on the processing of agricultural products. At its enterprises, fruit is canned and bottled, wine and sugar are made. During the Seven-Year Plan the production of wine in Moldavia is to be more than trebled, and sugar output is to be increased by 150 per cent. Over a hundred new wine-making enterprises, five sugar refineries, six fruit-canning works and a number of other enterprises are to be built.

The capital of Moldavia is Kishinev, the largest town of the republic. It lies on the River Byk, a right-bank tributary of the Dniester.

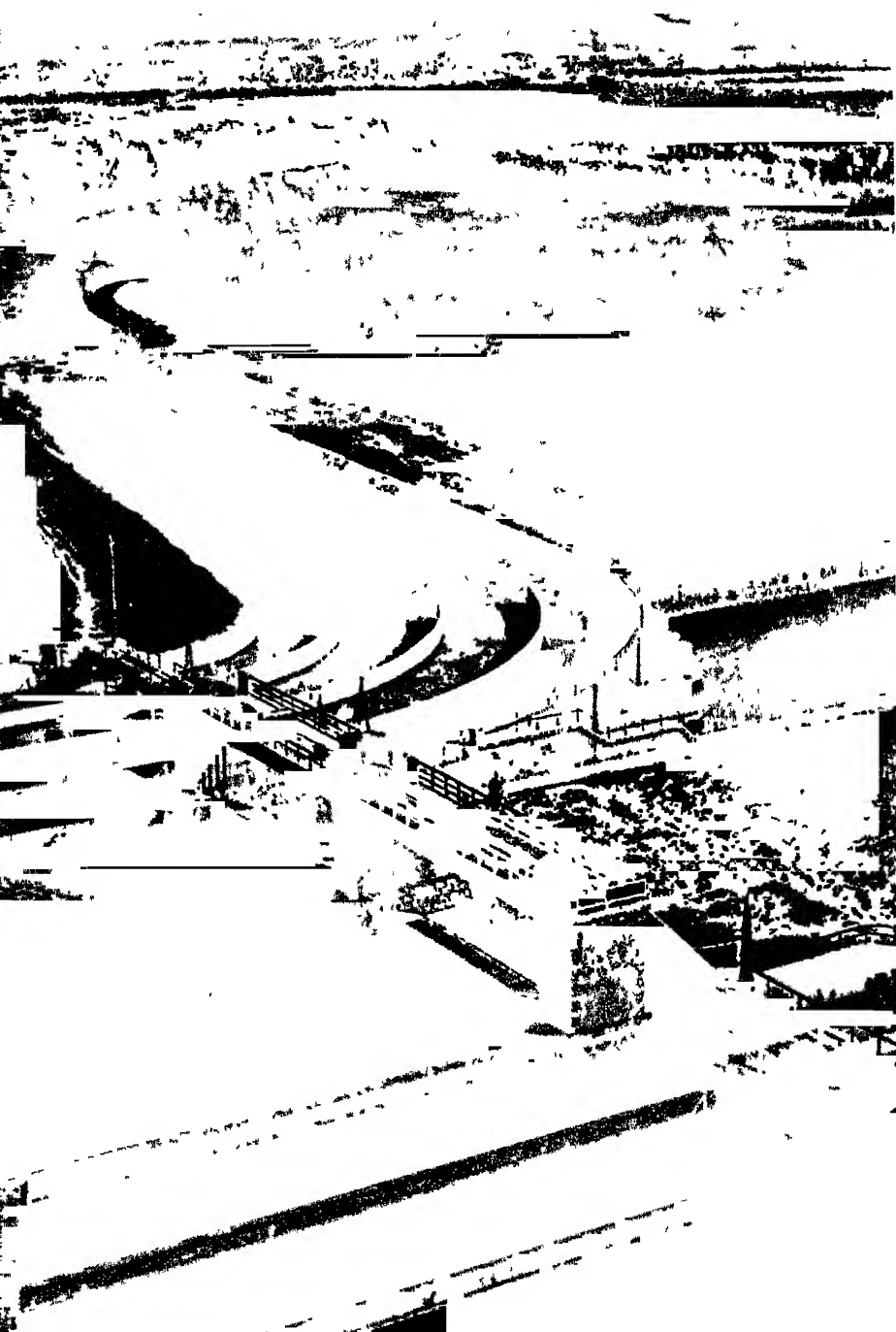
Food-processing remains the main industry in Moldavia, but the republic has its heavy industry, too. Kishinev, for instance, produces machine tools, motors and tree-planting machinery.

In Moldavia, where illiteracy was universal, it is now difficult to find even an old person who cannot read and write. Throughout the land schools and technical schools have been opened, and in Kishinev there are many institutions of higher learning, including the Moldavian University. The U.S.S.R. Academy of Sciences has a branch there. The number of books published in Moldavia in a year is more than all the books published during 150 years on the territory which now comprises Moldavia.

Soviet Moldavia now has its own intelligentsia.



Irrigation work under way in the Kara-Kum
Desert (Turkmenia)



Irrigation system in Kirghizia

LATVIA

[Area: 64,000 square kilometres. Population: 2,100,000]

The Latvian Republic lies on the eastern coast of the Baltic, where the broad Gulf of Riga cuts deeply into the coastline

The natural scenery of Latvia is beautiful wooded hills alternate with deep valleys and picturesque lakes In the north there is a hilly region known as "Līslānd Switzerland" The sea coast is lovely, too along the shore run lines of sand dunes with clumps of pine The broad River Daugava (Western Dvina) crosses the whole republic, flowing from south-east to north-west.

The capital of the Latvian Republic is Riga, which stands on the Daugava near its estuary on the Gulf of Riga Riga is one of the oldest cities in Europe In 1951, Riga celebrated the 750th anniversary of its foundation Along its modern districts we still find the narrow crooked alleys, the high-gabled old houses with tiled roofs and overhanging upper storeys, the ancient churches and castles, that Riga has inherited from the past

Riga's factories have been rebuilt and re-equipped in recent years Now they produce high-quality cloth, wireless sets, electric railway coaches, etc.

Riga is a beautiful city and its inhabitants continue to beautify it From spring to late autumn the city is redolent with the scent of flowers Young trees are being planted—lime, maples and horse-chestnut

After the Second World War an enormous amount of work was done to restore and expand Latvia's economy. Factories that had been destroyed by the Germans have gone into production again and many new enterprises opened, the area of arable land has been extended.

Latvia is developing not only her light industry but also heavy industry, principally machine-building The metal-working and machine-building industries occupy a leading place and provide about one half of the total industrial product

During the Seven-Year Plan the major tasks facing Latvian industry are the further growth of the electrical equipment and wireless equipment industries, and the development of instrument-making, transport machine-building and fisheries

One is always conscious of the proximity of the sea in these parts. In no place in any of these three Soviet Baltic republics is the sea more than 300 kilometres distant.

The main branches of agriculture in Latvia are dairy-farming, pig-farming, and poultry-farming

The cultural level of Soviet Latvia is rising rapidly. The republic has its own Academy of Sciences. Riga alone has seven institutions of higher learning.

Near Riga there is a beautiful holiday resort known as the Riga Beach. Through the clumps of pines on the golden sand dunes the sea is seen, and however slight the breeze there are always white horses running onto the shore from the sea. The Gulf of Riga is shallow near the coast and the waves break foaming on the pale sand. The air is always rich in the smell of ozone and pine resin.

KIRGHIZIA

[Area: 198,000 square kilometres. Population: 2,100,000]

The Kirghizian Republic lies in the east of Central Asia. Its main population consists of Kirghiz. In the south and east the republic borders China.

Kirghizia is a land of high mountains. The Tien Shan Range runs from west to east at ever-increasing height and at the Chinese frontier attains a height over 7,000 metres above sea level.

The Khan Tengri peak was always considered to be the highest point in the Tien Shans with a height of 6,995 metres. But in 1943 scientists discovered another peak, still higher, not far from Khan Tengri. This was mapped from a plane flying at a height of almost 10,000 metres. The height of the new peak, which was given the name of Mount Victory, is 7,439 metres.

The mountains of Kirghizia are perpetually covered with snow and glaciers. Below the snow line the mountain slopes are clothed in very rich mountain meadows. In the summer months there is much sunshine and humidity in these places and the grass grows tall, succulent and thick. On the northern slopes of the mountains the slim Tien Shan fir grows.

The mountains with their rich grazing-grounds occupy the main part of Kirghizia; animal husbandry, using the mountain pastures, is an important branch of the agricultural life of the republic.

Herds of cows and horses, flocks of sheep and goats, graze in the mountains throughout the summer. Sometimes they cross the steep and snow-clad mountain passes to winter in sheltered places between the mountains where they find fodder even in winter. But most of the herds and flocks are driven down into the valleys to places of permanent settlement. In the spring, when the snow leaves the alpine pastures and warm weather sets in and the lush grass shoots up, dotted with bright flowers, the herds and flocks go back to the mountains. And with them go the collective-farm shepherds and herdsmen, taking their folding felt *yurtas* with them on pack-animals.

A summer grazing-ground in the mountains looks like this. On the mountain slopes are the cattle, above them roam the sheep, and lower down are the horses.

The national costume of Kirghizia consists of a quilted gown, soft leather boots with skin overshoes, white felt hat with a black brim. On holidays the married women wear enormous turbans of white linen, wound in many layers.

In the valleys the *yurtas* stand on the banks of streams. The round, wooden lattice frames are covered with stretched felt. Among the *yurtas* burn branches of tree-like juniper or dried animal dung. Near the walls are spread *koshmı*—felt carpets—blankets and pillows. And on the walls themselves hang bridles, guns, and skin containers for the sharp, acrid-smelling mares' milk—*koumiss*.

In *yurtas* like these the Kirghiz used to live when they went roaming from place to place in the past. But what a difference there is

now in their entire way of life, in the whole economic structure of their existence!

Here is a small wireless station which maintains communications with the district centre, mobile creameries, veterinary dispensaries, mobile co-operative shops, medical stations, film projectors. And the *yurtas* themselves now serve only as convenient seasonal dwellings for the herdsmen in the Kirghizian villages permanent homes have been built.

The mountains become lower only on the edges of the republic—on the north (the valleys of the Chu and the Talas), on the west (a part of the Ferghana Valley). In these lower regions the climate is drier and warmer. Here the fertile soil is worked and irrigated artificially.

In the west lies the Ferghana Valley where cotton, rice and fruit grow.

In the north lies the Chu Valley, Kirghizia's principal valley.

The Chu, which has an abundance of water, runs down from the mountains and gradually grows shallower till finally it "disappears" in the desert where its waters are used for irrigation. In the zone of fertile foot-hills its waters are tapped extensively for the fields. Many new canals have been dug.

In the Chu Valley bast crops are sown—kenaf and southern hemp.

Another crop new to Kirghizia is now being sown—sugar-beet. For crop yield Kirghizia occupies one of the leading places in the world. Sugar refineries have been built. Kirghizia now makes her own sugar.

There are also large areas under wheat in the Chu Valley.

Farming is extensively mechanized. There are about 14,000 tractors and over 3,000 grain harvester combines working in the fields.

During the Seven-Year Plan, Kirghizian agriculture will continue to expand, concentrating on the production of cotton, sugar-beet, meat, and fine- and semi-fine-fleeced sheep-farming.

In Soviet Kirghizia, as in the Soviet Union as a whole, the villages are rapidly changing their appearance. On the southern shore of Lake Issyk-Kul, for instance, there is a village called Darkhany. It



Nikita Khrushchov among textile workers
at Tashkent

is no longer an aul as in the past. Electricity wires, carried on tall poles, run along the village streets. The electricity is generated at a local station and provides power to the kolkhoz mill and sawmill, and supplies the broadcasting station. The village has its secondary school, club and public park. New houses with several rooms each are under construction for the collective farmers.

Practically all Kirghizia's industry has been founded since the Revolution. Valuable metals are produced in the republic. Quick-silver and antimony are mined. In the Ferghana Valley there are several coal workings. An oil industry has also been started. Sugar production is increasing, wool and silk are processed.

During the Seven-Year Plan, the main accent will be placed on non-ferrous metallurgy, and on the oil, coal, gas, light and food-processing industries. The industrial produce is to be more than doubled. A big road-building programme will be carried out.

The capital of Kirghizia is the city of Frunze, situated in the north of the republic, in the Chu Valley. During Soviet times Frunze has been built up and has acquired an important industry. It is connected with the main rail system of the Soviet Union.

In the middle of the city there is a big square with flower gardens. The asphalted streets are lined with poplars. On the outskirts are the industrial enterprises opened in Soviet times and constantly expanding: a meat combine, a cloth mill, machine-building works. Frunze has an active cultural life. Both Kirghizian and Russian operas are presented at the national theatre.

The Kirghizian heroic epic *Manas* has been written down and published. The folk bard Sayakbai Karalayev dictated 379,000 lines of verse which he knew by heart.

At the present time the number of students in Kirghizia per 10,000 inhabitants is almost twice as many as in France and six times more than in Turkey.

Before the Revolution the Kirghiz were dying out. As a people they had no rights. There was no written language. They took their *yurtas* from place to place on the backs of camels or horses, spending almost all their lives in the saddle; they were quite illiterate and

went to quacks when they fell ill. Not a single Kirghiz had higher education. Now such things seem incredible to the young generation of Kirghiz. Kirghizia is giving the country gifted writers, musicians, artists, performers and scientists. Many of them were born in *yurtas*.

TAJIKISTAN

[Area: 142,000 square kilometres. Population: 2,000,000]

The Tajik Republic is in the south-east of Central Asia, bordering on China and Afghanistan, beyond which begins Pakistan (at one place the strip of Afghan territory dividing the U.S.S.R. and Pakistan is only 10 km. broad).

The mountains of Tajikistan in the main rise from north-west to south-east. Below lie dry hot valleys: in the north—the Ferghana Valley, in the west—the Hissar and Vakhsh valleys. The land in the oases is watered by irrigation canals. There cotton, alfalfa, rice, fruit (particularly apricots), and mulberry-trees grow. The climate is very hot in summer, especially in the valleys which are protected from the north and open to the arid south wind—the Afghan wind.

The flat part of Tajikistan occupies a comparatively small area but is densely populated. Irrigated cotton growing is the main branch of agriculture in the republic. Tajikistan holds the record for the U.S.S.R. for crop capacity in cotton. During the Seven-Year Plan cotton growing will be expanded, special attention being paid to the fine-staple varieties.

In Soviet times the irrigated area of Tajikistan has been greatly increased. The Vakhsh Valley, formerly a wilderness, has been turned into a glowing cotton region: here a big modern irrigation system has been built. In places where there used to be nothing but bare ground fields have been sown, roads laid and new kolkhoz settlements have arisen.

The villages of the Vakhsh Valley are for the most part new. The collective-farm settlers received subsidies from the state to help them establish themselves, and were helped to buy the cattle.

In the new villages of this valley live settlers from the mountains, too. From the deep gorges came many mountain folk who many centuries ago had been forced to migrate there from the agricultural lands on the plains.

The south-eastern, mountainous part of Tajikistan occupies a big area but is thinly populated. In the mountains, which are in some places bare, in others covered with pistachio-trees or tree-like juniper, the summers are cooler and more humid than on the plains. Here wheat and barley are sown. It took much work to clear and plough the fields lying often on steep slopes amidst rocks. Sometimes the Tajiks had to carry soil into the mountains in baskets on their shoulders. Nowhere in the Soviet Union are the fields cultivated so high up in the mountains as here.

Cattle and sheep are grazed in the mountains—in summertime high up on the mountain slopes, in winter—lower down, in the valleys.

The mountains are highest in eastern Tajikistan, the land of the Pamirs.

The mountainous areas of Tajikistan were quite roadless in the past, except for mule tracks. Now motor highways have been built, supplemented by air routes. The planes sometimes fly higher than the mountains, sometimes manoeuvre along mountain corridors.

The western Pamirs are cut with deep, narrow gorges. In the depths of these gorges swift torrents run. High amidst the cliffs we find sown plots of land, stone houses, occasional mulberry- and apricot-trees.

In places where it has not yet been possible to build modern roads, shaky bridges of logs weighed down by stones are flung across the mountain streams.

In the gorges of the Western Pamirs dwell the mountain Tajiks. The most ancient of the peoples of Central Asia, they were long considered the poorest, too. Their staple food was flat cake. They were lucky if it was made of flour—usually they used ground mulberries.

Now strong collective farms have been established in these parts. Their members raise sheep and cattle and sow barley; they have

introduced potato planting to the Pamirs. Meanwhile the cultivation of the land is being pushed higher and higher up the mountains.

Amidst the mountains of the Western Pamirs lies the town of Khorog, the centre of the Gorno-Badakhshan Autonomous Region. It is a new town with a secondary school, a teachers' training college, a botanical garden. A hydroelectric station has been built near the town.

Khorog lies 2,100 metres above sea level. Nevertheless it lies in a "well" — high mountains rise high above it on all four sides. At fixed times passenger and mail planes land there, their wings seeming just to miss the cliffs.

During the flight to Khorog you see toward the north an accumulation of mighty mountain peaks dominated by the Soviet Union's highest peak, Mount Stalin (7,495 metres).

The high mountain region situated in the middle of the Pamirs was first mapped by Soviet explorers. Near the Fedchenko Glacier, at a height of 4,200 metres, a hydrometeorological station has been constructed. Work is carried on all the year round there.

The Eastern Pamirs consist of uplands with a very high floor. There are no deep gorges there; in their place are flat saucer-shaped valleys.

In the valleys of the Eastern Pamirs dwell Kirghiz. Their cattle find grass on the mountain slopes and remain there during the winter, too. It is difficult for the clouds to climb up to the Eastern Pamirs, which are screened by the mountains, and there is practically no snow, although at the foot of the Pamirs it sometimes tops the telegraph poles.

The air in the Eastern Pamirs is highly rarefied. Because of the low pressure water boils at a lower temperature than usual. In summertime the days are parching hot, but at night the streams are covered with a film of ice. A strong, sand-bearing wind often blows in the Pamirs. Over a period of many thousands of years it has succeeded in places in eroding holes in the cliffs.

Nowadays the whole of the Eastern Pamirs can be quickly crossed by car; the journey would have taken weeks with a camel caravan in the past.

Before the Revolution 200 men found employment in industry in Tajikistan. During the five-year plans industries employing many thousands were set up. An important industry for processing agricultural produce was founded. In Stalinabad cotton cloth is produced at a large combine, in Leninabad silk is spun at large-scale enterprises and fruit is canned. A mining industry has been established; in the Ferghana Valley oil, coal and rare metals are extracted. A number of hydroelectric power stations have been built.

During the Seven-Year Plan much attention will be given in Tajikistan to the development of light and food-processing industries, to the production of building materials, and to the strengthening of the electric power supply. From its neighbour, Uzbekistan, the republic will get piped gas. A chemicals industry and a cement industry will be created.

The capital of the Tajik S.S.R. is Stalinabad. It arose on the site of the clay-built *kishlak* of Dushambe. This large well-built town has broad asphalted streets, many large houses and green parks.

In Stalinabad there is the Academy of Sciences of the Tajik Republic. Books are published in Tajik by modern writers as well as by the classics such as Pushkin, Gorky, Shakespeare, Balzac.

The Firdousi Republican Public Library contains a million books. In the number of doctors per 10,000 inhabitants Tajikistan has overtaken Great Britain.

A university has been opened in Stalinabad—the fifth institution of higher learning in the Tajik capital. It has faculties of geology, physics, history, philology and law. Before the Revolution only one Tajik in 200 could read and write.

ARMENIA

[Area: 30,000 square kilometres. Population: 1,800,000]

The Armenian Republic lies in the south of the middle part of Transcaucasia. It borders on Iran and Turkey.

Armenia is a land of a very ancient civilization. On all sides one can see in its mountains monuments of the remote past: fortresses,

the ruins of medieval towns, cave-dwellings and old bridges. The ancient churches show the characteristic features of Armenian architecture: massive walls of rough-hewn slabs of rock, small windows, sharp-coned stone cupolas, the absence of an altar apse, delicate stone carving in relief. The Armenian folk craftsmen carved animals, fruit and flower petals on the walls of the churches.

Civilized life has existed in Armenia for countless centuries. It was here that the land of Urartu was established—an eastern state that existed three thousand years ago, and is one of the oldest states in the world. In Armenia are the oldest existing buildings in the Soviet Union, dating from the 4th-5th centuries A D.

The Armenians had to defend their national independence against many powerful intruders—Assyrians, Romans, Arabs, Mongols, Iranians, Turks. The enemy often razed towns to the ground, annihilated the population or led it away into captivity. But the spirit of the people was unconquerable, and Armenian civilization was reborn to achieve splendid examples in literature and architecture, popular poetry and music.

Soviet Armenia is a republic with an advanced industry and mechanized agriculture.

During the five-year plans a powerful industry was built up in the land. It is linked to the extraction of useful minerals and to the processing of agricultural produce.

The largest industrial centre in Armenia is its capital Yerevan. In tsarist days Yerevan's only product was brandy—a mere hundred men were employed at the distillery. In Soviet times many large enterprises have been built in Yerevan. They provide the country with compressors, cables, transformers, cloth, canned food, watches, and generators for village hydroelectric stations.

Leninakan too has become an important industrial centre. Since the Revolution a cotton combine and a meat-processing combine have grown up there.

Copper is smelted at the town of Alaverdy. This is the only copper industry in Transcaucasia.

During the Seven-Year Plan the following industries will be con-

siderably expanded in Armenia: the chemicals industry (on the basis of the use of natural gas), the manufacture of precise machinery, tool-making, the food-processing and light industries. Two power stations using natural gas and two hydroelectric power stations will go into operation to reinforce Armenia's electricity supplies.

In the middle of Armenia rises the republic's highest mountain—Mount Aragats. Flocks graze on its slopes; at the very top a scientific astronomical observatory has been built. At the foot of the mountain stands the new industrial town of Artik where tufa, a pink porous stone which can be cut with a saw, is quarried. Tufa has been used in the construction of many buildings in the Soviet Union, including the turbine room at the Dnieper Power Station.

Armenia's factories receive electricity from power stations built on the mountain rivers. Armenia generates more electricity per head of population than France. The water resources of the capacious Lake Sevan, which lies high up in the mountains, are tapped. A part of the lake's water is brought down in stages along the bed of the River Razdan along which power stations have been built. After having set the turbines in motion and producing electricity the water flows to the fields to irrigate new areas under cotton and vines.

Armenia lies on a high plateau. Its flat, elevated hollows, stony in some places, covered with grass in others, are surrounded by mountain ranges. The mountains prevent the humid winds from reaching Armenia and the climate is dry and continental. The summers are very hot, the winters relatively cold.

In the mountainous parts of the country animal husbandry and grain-growing are practised: oats, barley and wheat are sown, cheese is made.

But these mountainous regions are thinly populated. The valleys are more densely inhabited. It is warmer there and with the aid of artificial irrigation the land yields rich harvests of cotton, grapes and fruit.

In summer the heat is scorching, there is practically no rain. In places where there is no irrigation the valleys are burned up by the sun and nothing grows there.

But this uncultivated ground is constantly decreasing in area. New canals are being dug continually. Settlers are being brought down from the mountains to the irrigated land.

The mountain villages of Armenia used to consist of smoky, sooty huts of stone and clay. Now spacious cottages with verandas and big windows are being built. It is unusual to find a village without electricity. The roadside springs are enclosed in lovely niches of stone, and sometimes of marble. From these village springs you feel that the pride of Armenia—the art of the stone-mason—is again flourishing.

Yerevan itself displays a new national public architecture in full flower.

Probably not one of the old cities of the Caucasus has changed as much as Yerevan during recent years.

Old Yerevan was an unattractive place with narrow streets, flat roofs, clay shanties. It was known as the "clay pot." Now Yerevan is a city with beautiful houses, broad avenues and an abundance of verdure.

The city lies in a valley between mountains. At noon it is hot, in the evenings cool. South of Yerevan, beyond the Turkish frontier, rises snow-capped Mount Ararat. In the day-time it is white, at sunset pink, in the moonlight blue. Although Ararat is sixty kilometres away, from the streets of Yerevan it looks as though it were rising above the city itself.

Many new residential quarters have been added to Yerevan, and more are constantly under construction. The houses are built of stone of many shades—pink, yellow, blue, orange, black, silvery. The new Opera and Ballet Theatre is one of the largest and loveliest in the U.S.S.R. It has a very large stage and two auditoriums.

To obtain a full picture of the way the cultural life of Armenia has revived, one needs to visit the lecture-rooms of the institutions of higher learning, the theatres, the Academy of Sciences. Yerevan had no such places before.

Many Armenians have returned to Soviet Armenia from all over the world. They emigrated before the Revolution, because their native



Young scientists in a Central Asia medical
institute



Donbas miners' children in a crèche

land did not provide them with the means of existence. On return they have all found work, homes, and good living conditions.

At Echmiadzin near Yerevan lies the religious centre of Armenians throughout the world. Here is the residence of the spiritual head of the Armenian people—the Katolikos

TURKMENIA

[Area: 488,000 square kilometres Population: 1,500,000]

The Turkmenian Republic lies between the Caspian Sea on the west and the River Amu-Darya on the east. In the south the republic is contiguous with Iran and Afghanistan.

Turkmenia is about the size of Spain.

Besides the clothes worn generally throughout the Soviet Union we find the national Turkmenian costume in use. The men wear long dark-red gowns and enormous black fur hats. Many a swarthy face wears a few wisps of beard below a clean-shaven chin. The women too wear deep red. Their dresses are decorated with silver pendant ornaments. Sometimes they wear tall headdress under a shawl that falls over the shoulders.

Turkmenistan has little water and much sun. That is the main feature of its nature.

In summer the climate is extremely hot, and rain is practically non-existent.

Because of insufficient humidity and an over-abundance of heat, three-quarters of the territory of Turkmenistan consist of desert. This desert is called the Kara-Kum; it is one of the biggest stretches of sandy desert in the world.

On the heat-cracked sand grow clumps of stiff, thorny grass. Here and there grows bare, gnarled saksaul—the trees that give no shade. At places the sand is piled up in rippling dunes.

However, the sandy desert is not lifeless.

Under the baking sand there is moisture. And where the sand is not broken up by the hooves of herds the desert is covered with grass.

scanty and dry, it is true, but grass, all the same, which provides fodder for the karakul sheep which is well adapted to life in the desert and gives a valuable skin—the karakul. The desert grass is also cropped by camels, creatures of frugal habits which replace horses in the desert as draught animals. Turkmenia, incidentally, breeds excellent riding horses.

Before the Revolution the Turkmenians roamed the desert with their herds and flocks, moving from well to well. They never prepared hay and were eternally dependent on the desert.

Now a well-regulated animal husbandry has been established. The nomads have settled down in villages. The herds and flocks are now driven to seasonal grazing-grounds according to a definite schedule worked out on scientific lines. Fodder is stocked up for the winter.

In places where the sand broken by the previous, incorrect way of grazing the cattle, and dispersed by the wind, is gaining ground of arable land and oases, it is now being stopped by the sowing of sand-binding varieties, mainly saksaul, which is done by scattering seed from aircraft.

The main occupation in the unwatered desert is animal husbandry, but in recent years a start has been made in cultivating the land. Scientific research stations have worked out the agrotechnique of the desert. At Repetek, for example, vines up to 1½ metres high grow in trenches. A water-melon harvest running into hundreds of centners per hectare is gathered.

The inhabitants of Turkmenia live mainly in the irrigated oases. These oases lie scattered in the south of the republic, along the railway line, where rivers flow down from the low Kopet-Dag Mountains and from the spurs of the Parapamiz and irrigate parts of the desert. Oases are to be found also in the east and north-east, where the Amu-Darya flows along the borders of Turkmenistan and feeds the irrigation canals.

It is with irrigation that the main branch of Turkmenia's agriculture—cotton growing—is linked. Under the hot sun the best variety of long, silky-staple cotton grows on the irrigated soil of Turkmenia. Turkmenian *kushmush* (a special variety of small grape rich in sugar

content), and the sweet, succulent, fragrant melon known as the *guluyabı* (rose oil) are famous far and wide

Much irrigation work is being done in Turkmenia: at present, for example, the great Kara-Kum Canal is under construction. Its first section, 400 km. long, is already completed. The waters of the Amu-Darya are now reaching the biggest oasis in the republic, the Murghab Oasis which suffers from a lack of water.

In the valleys of south-west Turkmenistan, which are protected by the mountains from the north winds, we find subtropics where frost is almost unknown. Here the state and collective farms have laid out plantations of olives and figs and planted date palms.

The women of Turkmenia have attained perfection in the art of carpet weaving. The deep red background of the Turkmenian carpet is soft, the colours are tender, the designs are beautiful. At Ashkhabad you can see the State Collection of Carpets. There are collected the smooth and motley-coloured carpets of the Pendinsky Oasis, the rough carpets of the town of Kerke, the carpets of Mary, with their delicate patterns.

In Soviet times Turkmenistan has built up an important industry, something she did not possess before the Revolution.

In the west of the republic, near Nebit-Dag and on the Cheleken Peninsula, oil is extracted. An oil-processing industry has been established.

In the heart of the Kara-Kum Desert a sulphur works has been opened. Previously the depths of the desert could be reached by camel but now you can reach the sulphur works either by car or plane. A journey that took many days in the past can now be done in half-an-hour.

In Turkmenistan, new enterprises have been opened to process the produce of local agriculture. In Ashkhabad a large textile mill has been built, which uses Turkmenian cotton. At mills in other towns cotton wool is made, wool and silk are spun.

During the Seven-Year Plan the oil, gas, chemicals, light and food-processing industries of Turkmenia will be rapidly developed. Fertilizers will be produced for the first time.

The capital of Turkmenia is Ashkhabad. The town stands at the foot of the Kopet-Dag Mountains, on the edge of the desert. It is a large town with wide streets, among the dense foliage its houses are a dazzling white in the sunshine, irrigation ditches along the sides of the streets are concrete-lined to prevent the precious water from seeping into the sand.

Ashkhabad is a centre of Turkmenian cultural life.

In tsarist days the literacy rate in Turkmenistan was only 0.7 per cent. Turkmen women were completely illiterate. On the eve of the Revolution only two Turkmenian girls went to school. Now more than a thousand young Turkmenian women are school teachers. Hundreds of women have become doctors.

The republic has several institutions of higher learning, theatres, publishing houses, an Academy of Sciences.

ESTONIA

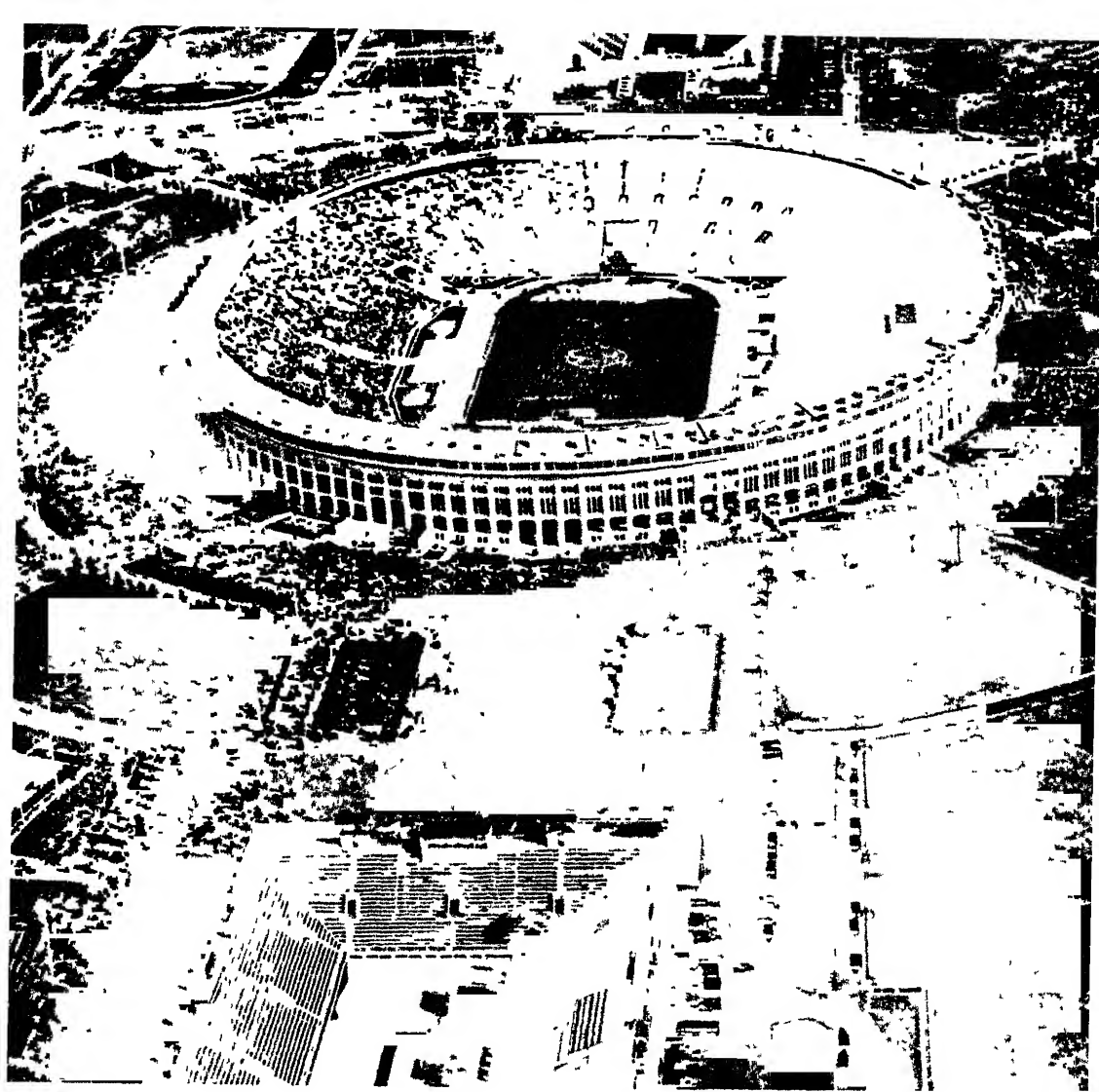
[Area: 45,000 square kilometres. Population: 1,200,000]

The Estonian Republic is the most northern of the Soviet Baltic Republics. Its gently-sloping hills are the result of glacial action in the remote past. It is a land of lakes, copses and rich meadows. The fields are strewn with boulders. In June there is no darkness at night. Estonia lies on the coast of the Baltic Sea, between the Gulf of Finland and the Gulf of Riga. The Moonsund Islands of the Baltic, of which the biggest are Saaremaa and Hiiumaa, also belong to Estonia.

In the north of the republic are flat lowlands which slope down to the Gulf of Finland in a series of rocky shelves. To the south the country rises and becomes hilly.

Estonia has many lakes. The biggest of these is Lake Peipus (Chudskoye). The rivers are short but contain much water.

The climate of Estonia is humid. The abundance of good meadow land facilitates the development of animal husbandry, especially dairy-farming. The meadows and pasture lands are more extensive than the arable land. Besides, large areas are sown to fodder crops.



The Lenin Sports Stadium at Luzhniki, Moscow



Holiday makers on the Black Sea coast

During the Seven-Year Plan the agriculture of Estonia will continue to specialize on pedigree milk cattle, meat and bacon pig-farming.

By the end of the Seven-Year Plan Estonia will be producing three times more milk per capita than the United States. The level of per capita meat production will also surpass that of America

In Estonia a big programme of marsh reclamation is in progress. Excavators scoop up the wet peaty earth. Canals are driven through the fields, river-beds are straightened

Estonia has an important machine-building industry and large textile and timber industries. The republic is rich in combustible shale. This shale is not only consumed in the furnaces of electric power stations, when processed it provides gas, domestic fuel, medicinal products, dry ice and building materials. The streets in Estonian towns are covered with asphalt derived from shale

The big shale pits of Estonia are equipped with coal-cutting machines, conveyor belts and electric locomotives, the air is kept fresh with powerful fans. Factories have been built to convert shale into gas. Nearby, towns and settlements for the miners and workers in the chemicals industry have arisen. Gas for both industrial and domestic purposes is sent by a new pipeline to the capital of the republic, Tallinn, and to Leningrad

The annual increase in Estonia's industrial product is now almost equal to the annual industrial product of Estonia before the establishment of the Soviets there

During the Seven-Year Plan the following industries in Estonia will develop at a particularly rapid tempo: shale production, the chemicals industry, electricity production, machine-building and the textiles industry. At the end of the Seven-Year Plan, Estonia will be producing $3\frac{1}{2}$ times more electricity than all tsarist Russia used to produce.

The fishery industry is expanding. Estonia is known throughout the world for its eel catch. Estonian eel is a fatty, tasty fish, excellent when smoked

Tallinn, the capital of Estonia, is situated on the shore of a convenient bay in the Gulf of Finland

The city, particularly its upper part, known as Toompea (Vyshgorod), retains interesting medieval features. Old towers and fortress walls of grey stone nestle on the rocky hillside. One sees crowded rows of houses with pointed roofs of white-edged slate, coats-of-arms on housefronts, narrow, stone-paved streets, the tall spires of churches.

And side by side with all that—Tallinn's modern port, the big factories, the new, broad-windowed buildings.

Estonia now has an Academy of Sciences whose research programme is contributing to the economic progress of the republic. For one thing, the Academy has worked out methods of using the republic's chief mineral wealth, combustible shale.

The secondary schools of Estonia are now attended by nearly three times as many pupils as before the Soviet system was established.

Estonia's famous Tartu University today has a larger student body than ever before in its history.

WAY OF LIFE

Old Russia too had its gifted people, its eminent scientists, its men of letters, its artists. But as a whole the cultural level of the country was very low. Three-quarters of the population were illiterate.

Russia was a land of inexhaustible natural wealth. Nevertheless, because of the tsarist regime, which kept all life in fetters, it resembled an undiscovered continent. Nine-tenths of the land were geologically unexplored.

As we have seen, there had been a certain amount of industrialization, but it was quite inadequate. Occupying the first place in the world in area and the third in population, Russia lagged behind the United States, Germany, Great Britain and France in industrial production. Its factory equipment was obsolete. Agricultural machinery was practically unknown and farming was carried out by old-fashioned methods. This is a typical picture of the past: a peasant crosses the field behind his horse, urging it on wearily; he wears himself out with work but everything goes slowly. The ploughman goes off to the end of his furrow, but you will not wait for him to return. However hard he presses on the wooden plough, it will not drive deep into the earth. His grandfather used a plough just like that; he, too, drove the same sort of furrow with the wooden teeth of his harrow. He sowed by hand from the same kind of bast basket. And he threshed with the same kind of flail.

Naturally, the people's consumption was very low. Most of the population of Russia were peasants, their principal produce being grain, but half the peasantry went short of grain. Sugar was too

expensive for ordinary folk, although in their drive for profits the sugar manufacturers sent it to Europe at dumping prices for pig fodder. The peasantry went about in bast shoes.

The people were deprived of political rights and were morally humiliated. The peoples of non-Russian nationality whom the tsarist officials scarcely considered as human beings were in a particularly onerous situation.

The factories were bossed by arrogant capitalists, figures from some distant, sated world. In the villages the peasant had to bow down before the landlord and beg for a patch of land on rent, paid for by a share in the harvest to come. He had to kowtow to the kulak—maybe he would lend him some seed—with a promise to repay the loan with double the amount. The police uttered threats and brandished their sabres. “Don’t argue!” And on the wall hung a portrait of the tsar: he was the one who called you to the colours and sent you to die in a war in an unknown cause.

Agrarian Russia carried with her the yoke of a semi-colonial existence. The Russian people languished under foreign dominance. Before the First World War foreigners owned almost three-quarters of Russia’s metallurgical industry, almost three-quarters of the collieries of the Donbas, the only coal-field in the Russia of those days, over half of the oil industry. And such branches as the manufacture of electrical equipment were almost entirely in foreign hands.

The First World War, which broke out in 1914, at once revealed the utter backwardness of tsarist Russia. The industry quickly choked: the army was short of guns, rifles, machine-guns. Sometimes shells were rationed at five or six a day per gun. Every other cartridge fired was of foreign manufacture.

Much of the land remained uncultivated. Transport was chaotic, locomotives were without fuel. There was a shortage of bread in the towns and cities. Russia was brought to the verge of catastrophe. The country was threatened by a complete loss of her independence, by becoming a colony of foreign powers in the full sense of the word.

At that moment of utter collapse it seemed that nothing could save Russia

However, Russia did not perish. Instead, her people's energetic work and powerful moral qualities have made it a great world power

Who, then, saved Russia? Who drew her up from the depths of the abyss on to the broad road of progress? The working class and the working peasantry, led by the Communist Party.

At the turn of the 19th century, when all the contradictions of imperialism were summed up in Russia, the country became the centre of the revolutionary movement. The Russian working class, living in very difficult conditions, became tempered in struggle and founded a Communist Party led by Lenin.

The revolutionary storm gathered. And at that moment when all Russia, exhausted by war, faced the crucial question—to enter into servitude to foreign powers or to make a radical change—the people made its choice. At the decisive hour the energy of the people set a light to the purifying fire of the Revolution. Headed by the Communists, by Lenin, the working class led the whole of Russian people into the decisive attack and was victorious. In February 1917, tsarism was overthrown. Eight months later Russian capitalism shared the same fate.

The workers and peasants took state power into their hands to save the country and advance to a higher, socialistic method of production.

All the shifts of reaction, all the attacks of the interventionists were defeated, although fourteen states took part in the attack on Soviet Russia.

Over half a century ago, at the end of the 19th century, Lenin had shown Russia the way. He said that her working class, the most revolutionary force of society, in alliance with the peasantry, would overthrow tsarism and capitalism and establish its own power which would guarantee the people happiness. That is just what happened. That is the very road that Russia took.

But it is one thing to proclaim the welfare of the people as an aim, another thing to achieve that aim. The leaders of the Soviet state fully realized that difference, and in those times promised no one a paradise on earth, did not talk about "a life of abundance". On the contrary, they appealed to the people to suffer privations and work strenuously. And the people, grasping the realities of the situation, responded to this stern appeal.

People cannot attain a happy life in a country that is poor, ravaged and weak. And in those days Russia was just that. The Revolution accomplished, a strong rich land had to be built up in the shortest possible time. Otherwise all that the Revolution had achieved would be lost.

And, led by the Communist Party and its Central Committee which, after Lenin's death, was headed by Stalin, the Soviet people achieved during the five-year plans something that had seemed incredible: in an unprecedentedly short time they changed their vast and hitherto backward land into a mighty world power.

The country took the road to prosperity. The welfare of the people increased rapidly. But in 1941 Hitler blocked that road. His armies dealt the land of the Soviets a sudden and tremendous blow. After all, his armies were supplied with weapons that had been forged not only in Germany but in many other European lands that the Germans had overrun.

For four years the bloodshed continued. But Hitler's attempt to crush the Soviet Union failed.

After the war, the rich lands in the west and south of the Soviet Union lay ravaged. An area inhabited by almost half the Soviet population had been laid in ruins by the invaders. They had destroyed the country's main coal and metallurgical base in the Ukraine and laid waste the principal agricultural region. Towns and cities had been devastated by bombs and mines. Villages had been reduced to ashes.

Once again the Soviet people accomplished wonders: during the first post-war five-year plan they not only restored but surpassed the pre-war level of the national economy.

People spared no effort and quickly wiped out all traces of the war. And again we heard that resounding note which had dominated life before the war—that of the advance of the people's welfare.

The peaceful construction of the Soviet Union continues. With each year the people benefit more from it.

* * *

What, then, is that way of life for which the Soviet people are striving with such unprecedented heroism?

Let us glance first at the material aspect.

To what extent does the Soviet Union guarantee people work?

It must be said that in the Soviet Union this question has a strange ring. The point is that for many years there has been no unemployment in the Soviet Union. Up to 1930, when the consequences of the devastation caused by the First World War were still being felt, there was still some unemployment, but later it was fully eliminated. And people have now quite forgotten that there ever was such a thing.

On the other hand, Soviet industry has such potentialities that the enterprises tend rather to experience certain difficulties arising from a shortage of labour. The back page of local newspapers are always spotted with announcements of vacancies in all trades and professions. At the railway stations, on the town squares and at factory gates hang notice-boards listing vacancies.

The most important thing is that full security of employment in the U.S.S.R. is not the result of some big temporary boom. No, it is a constant factor, an integral part of the Soviet economy. Soviet industrial production does not move in fits and starts, its advance is a constant upward progress. Any fears of an impending crisis are quite foreign to the Soviet man.

The reason for this is that the Soviet economy is developing according to a definite plan based on scientific premises. The plan is drawn up in such a way that it envisages a consistent, systematic growth of production. Thus the absence of crises and, consequently,

of unemployment is the result of the working of a profound, objective law—the law of the planned growth of the national economy

This is what made it possible for the Soviet Union to guarantee man the right to work—the first time this has ever been done. The Soviet Constitution runs “Citizens of the U S S R. have the right to work, that is, are guaranteed the right to employment and payment for their work in accordance with its quantity and quality”

But to be given work is not enough; the worker must receive adequate earnings to satisfy his needs. And it is important that these earnings are not reduced, that they do not even remain stable but rise, since human requirements are constantly rising and expanding, too.

What is the situation in the Soviet Union in this respect?

The Soviet people's living standards depend not only on individual earnings but also on the state's increasing expenditure on social services and cultural amenities. In addition to their wages in cash, Soviet workers receive from the state additional payments and advantages which increase the real wage by over one-third

For example, everybody, whether he lives in the town or the country, gets free medical aid, including treatment in hospitals and polyclinics. Soviet public medicine has a deservedly high reputation throughout the world

The high level of the health services and the rise in material welfare and cultural standards have caused the death rate to fall sharply in the Soviet Union. General mortality has been reduced to a quarter of the pre-Revolution figure and infant mortality to one-seventh. The average expectation of life has risen from 32 to 68.

Soviet workers, including office workers, receive from their trade unions free or reduced-price admission to sanatoriums and rest-homes. They have annual holidays with full pay of two to eight weeks, according to the type of work they do

Expectant mothers are given fifty-six days leave with pay before confinement and an equal period after confinement. Mothers of three or more children and unmarried mothers receive monthly allowances from the state.

According to the law every worker enjoys the right to material security in his old age. All who work receive pensions from the state on reaching a certain age and length of work. As a rule, men qualify for this pension at the age of 60, having worked not less than 25 years, women at 55, having worked 20 years. Some categories of workers receive pensions at an earlier age and with a shorter length of work.

Should anyone fall ill he does not have to worry about how he is going to pay for treatment or how he is going to live during treatment. While disabled, workers receive benefits from the state social insurance fund which is managed by the trade unions. The workers are not called upon to make any contributions to this fund.

. What, then, are the real wages of a Soviet man?

In 1958, the real wages of workers including pensions, grants, free education and free medical services, amounted to almost twice the figure in the pre-war year of 1940. During the same period the real income of the average peasant has more than doubled.

People's incomes will go on increasing. during the Seven-Year Plan (1959-1965) the real income of workers will rise on an average of 40 per cent as a result of increases in wages, pensions and grants, as well as of the lowering of prices in public catering establishments. The real incomes of collective farmers will also rise by not less than 40 per cent, mainly as the result of the increase of social production in the kolkhozes

Thus, the requirements of the public are growing rapidly. In 1958, the production of consumer goods was 13 times greater than before the Revolution.

Housing construction has assumed a very large scale in the Soviet Union. During the past five years alone considerably more houses have been built in towns and workers' settlements than existed there in 1913. During those same five years the collective farmers and rural intelligentsia built more than 3,000,000 houses in the countryside

A tremendous housing programme is being unfolded during the current Seven-Year Plan. The construction of about 15,000,000 dwellings in towns and workers' settlements is envisaged. This is more than the total amount of housing built during the entire period of Soviet power. In country districts, about 7,000,000 new houses are to be built. This means that during seven years about 22,000,000 families, or about 100,000,000 people, will receive new homes. As a result, within a few years after the end of the current Seven-Year Plan the housing shortage will have been entirely eliminated. At the same time it should be noted that in the Soviet Union rent, including public services, amounts on the average to between four and five per cent of the family budget.

In the Soviet Union the working day is being gradually shortened without loss of pay. During the Seven-Year Plan the switch over to a six- or seven-hour working day with two free days a week will be completed. As a result of this step the Soviet Union will have the shortest working day and the shortest working week in the world, with a simultaneous increase in public welfare.

Even today the proportion of taxes levied on the population is insignificant in the state budget—7.8 per cent of the revenue. In the near future the Soviet state will completely abolish taxation.

That is the situation in the Soviet Union from the material point of view. Now let us glance at cultural and educational questions.

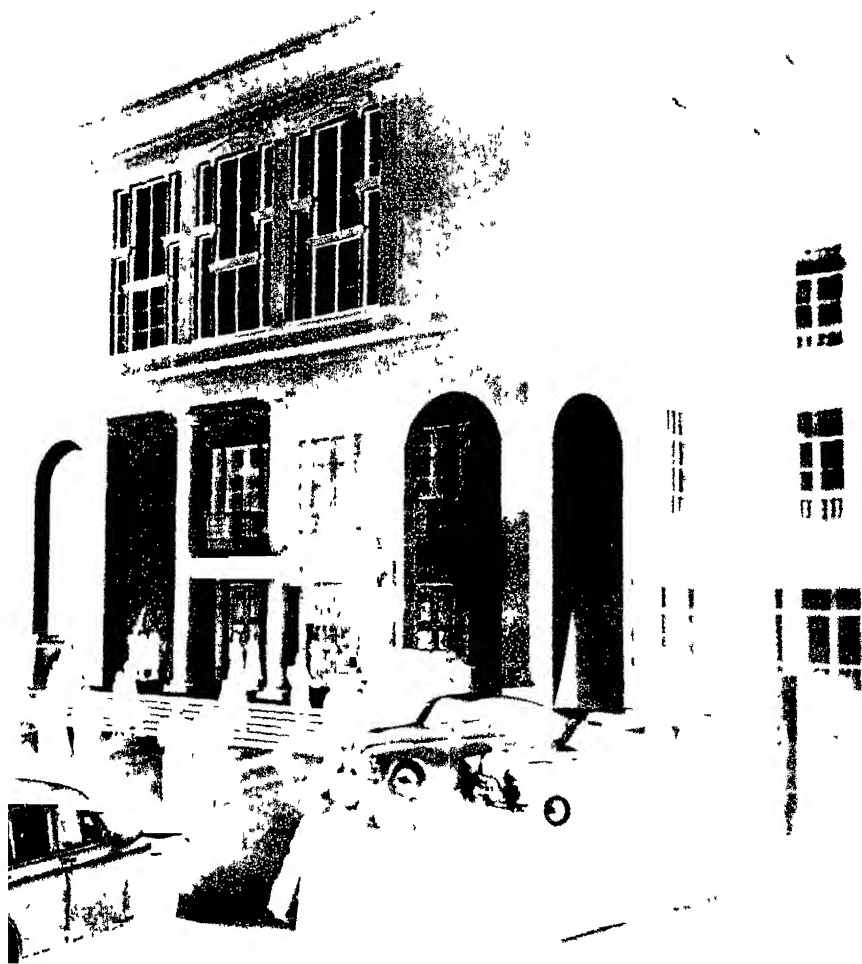
Let us take first the most elementary of all—literacy, the general level of education. It is clear to all that this is the first condition of a nation's intellectual life.

The liquidation of illiteracy during Soviet times has resulted in the U.S.S.R. becoming a land of total literacy. Only very occasionally in some remote place does one meet an old man who does not know how to write; that, incidentally, does not prevent him from having people of higher education among his children and grandchildren.

In the Soviet Union, all forms of education, from primary school to higher education, are free. The state provides material aid to the



Indian film festival at the Udamnik Cinema,
Moscow



Palace of Culture of the Stalingrad Tractor Works

overwhelming majority of students, giving them grants and housing them in hostels

Before the Revolution there were only 96 institutions of higher learning in the land. Now there are 766. These institutions are attended by about four times more students than the total in Great Britain, France, West Germany and Italy combined.

Soviet institutions of higher learning are now turning out almost three times more engineers than similar institutions in the United States. The number of specialists with higher or secondary specialized education employed in the national economy stands at about 7,500,000, i.e., 39 times more than in 1913.

Over 50,000,000 people are studying in one way or another in the U.S.S.R. In other words, every fourth person is studying.

People are free to choose their trade or profession, and they have a free choice of where they wish to study. Only one criterion is applied when it is a question of entering an institution of higher learning: the level of knowledge and of practical experience. The individual's ability, his individual value—that is what decides the future of a young Soviet citizen and determines his place in life.

And what does practical work at factory, farm or construction site demand from the Soviet man or woman? Above all, the spirit of initiative. It could not be otherwise. The unprecedented tempo of development in the Soviet Union means that life is always leaping ahead, creating new forms for itself all the time, laying new roads for itself. After all, Soviet industry is to raise its production by 80 per cent in seven years. And that increase is to be measured not in quantity alone but in quality. Such a tempo does not permit people simply to go on repeating their past successes. Geologists are looking for new deposits of raw materials, because the old ones are inadequate. Constructors are designing new machines, because the productivity of the old ones no longer satisfies the requirements of the factories. Agronomists are breeding new varieties of plants, because the crop-yield of the old ones fails to meet the growing demands. And so, what is needed from Soviet people is first and

foremost, a spirit of initiative, creativeness, audacity, a spirit of innovation Unless a man develops these qualities life will leave him behind

Some people think that favourable conditions for the creative flowering of human personality are to be found only in the fields of art and science, and that they do not exist in the factory: there, they think, you just do what you are told. However, in Soviet conditions this is not applicable.

Science and art, of course, require the greatest creative initiative, all the more so because they are in so active a state of development in the Soviet Union At the end of 1959 there were more than 310,000 scientific workers in the U.S.S.R.—approximately 30 times more than before the Revolution. The great physiologist, Pavlov, wrote these words about the attitude of the Soviet state to science: "Our land offers great scope to scientists, and—to give credit where credit is due—we must say that science is generously applied to life in our country—extremely generously"

The successful results of these efforts in the field of Soviet science are known to all. For example, in the Soviet Union has been built the most powerful accelerator of charged particles in the world, with a capacity of 10,000 million electron-volts A number of fast electronic computing machines have been made. Everyone knows the resounding successes of the Soviet Union in launching spaceships

But it is not science alone that requires an active creative spirit from man in the Soviet Union. So does practical work, because that too is constantly advancing

There is one graphic proof that the Soviet worker can display his creative personality in the factories and fields, as well as in science and art: the Soviet Government decorates not only scientists, writers, musicians and artists, but also engineers, workers, agronomists and peasants—whenever they have achieved outstanding successes in the field of innovation at work

It would be naïve to think that workers and peasants accomplish these things only for the sake of being decorated. Awards, of course,

act as a stimulus to creative work, but it is quite obvious that unless such work was being done there would have been no question of awards being given

What is it, then, that makes the average worker in Soviet industry and agriculture experiment, search for new methods of work, and raise productivity with all sorts of inventions?

Of course, the material factor plays no small role here, since the growth of the productivity of labour gives the worker the legal right to increased pay. That is easily understood

But as soon as we seek an explanation of the stimulus that acts as an incentive to advanced Soviet worker-innovators, we have to answer a more complicated question. There is, incidentally, one immutable fact to be taken into account: Soviet innovators do not make a secret of their inventions. Should one of them, as the result of long, persevering, difficult work, discover some new method, he will at once pass it on to all other workers. And the new method of raising production will be made widely known and become general.

Innovators usually publish their inventions in the press, they receive visitors from other factories and often they even write books on their methods—books which circulate throughout the land.

A well-known Urals gear-cutter named Ponomarev, for instance, published a book describing his methods of working at the bench, which have resulted in his fulfilling 30 annual norms in the space of 5 years. And in his book *Highly-Productive Methods of Gear-Cutting* we find those methods described in detail, with accompanying illustrations. The Ukrainian collective farmer Ozerny and the Kirghiz collective farmer Kainazarova have published their books, too. The former describes the method which enabled him to set a new record in the productivity of maize growing, the latter writes about her record-breaking method of growing sugar-beet. In recent years many similar books have appeared in the Soviet Union, written by worker and peasant innovators, each of whom tries to find the clearest way of explaining his "secret" to as many people as possible

No one forces these men and women to write those books. What motive, then, moves their pens?

Or take this example. Valentina Gaganova, a textile worker from a mill in Vyshny Volochok, who headed a leading team and as a result received high earnings voluntarily transferred to a team that was lagging in order to give it the benefit of her experience and to raise it to the level of the leading teams. What made this woman voluntarily give up higher earnings, if only temporarily?

There is but one answer: the moral make-up of an advanced Soviet citizen is such that he does not differentiate between his personal interests and the interests of the country as a whole. He is one with his people—the better for them, the better for him. He does not set himself up against the state; indeed, he puts the interests of the state above his own personal interests.

The advanced Soviet citizen has risen to so high a level of social consciousness that he voluntarily devotes himself to the common cause.

The clue to the question is the fact that Soviet man lives in a land where private ownership of the means and instruments of production, that type of ownership that makes it possible for man to exploit his fellow man and to appropriate and live off his work, was eliminated long ago. Another type of private property which is not connected with exploiting others is not only permitted, it is protected most definitely by law.

In the Soviet Union every citizen has the inalienable right to own the wages he received for his work, his savings, his home and garden, his household goods and everything he needs for his personal use and comfort. The right to bequeath this type of property is also inalienable.

No individual can own factories, machinery, raw materials, or other means or implements of production in the Soviet Union. That is the very essence of the Soviet socialist system. And once there is no private ownership of the means of production there can be no exploitation of one man by another.

It is many years since a single capitalist existed in the country. Even elderly people can have only vague memories of capitalists. And for those who were born and brought up in the Soviet environment the concept of "capitalist" is of something almost archaeological.

In the Soviet Union every able-bodied person is obliged to work. There are only two classes of people in the Soviet Union—workers and peasants. In addition there is the category of working intelligentsia. There are no other classes. This does not mean that everyone in the Soviet Union goes to work in a factory or office. Many women, for instance, serve their families by doing house work.

The means and implements of production are socialist property which is divided into state (national) and co-operative kolkhoz property. The overwhelming proportion of the means and implements of production belongs to the state, in other words, to the people as a whole, the rest belongs to kolkhoz and co-operative organizations.

Insofar as in the Soviet Union the means and implements of production belong predominantly to the socialist state, the national economy can be conducted according to a unified and precise plan. The plan is worked out on scientific foundations and its fulfilment is enforced by law. It is precisely owing to the planned nature of the Soviet national economy that the country knows neither economic crises nor unemployment, as we have noted above.

The plan for the development of the Soviet economy, naturally, cannot be subordinated to the interests of any private businessman, group or monopoly, inasmuch as these do not exist. It is drawn up entirely in the interests of the state. And what can be the interests of the state, if that state is created by the people themselves? The interests of such a state are clear and obvious: to improve the life of the people who created that state themselves. After all, the state consists exclusively of working people. In the Soviet Union the principal economic law of socialism operates: *the ensuring of the maximum satisfaction of the constantly increasing material and cultural requirements of the whole of society by means of an uninterrupted*

growth and improvement of socialist production on the basis of higher techniques

The only preoccupation, other than the direct satisfaction of the needs of its citizens, with which a people's state ought to concern itself, is to be strong enough to be able to expand social production and to prevent any eventual aggression from without, again with the same ultimate aim of making the welfare and happiness of its people secure

The Soviet people's concern about their own welfare and the strength of their state is reflected in some interesting figures—those which refer to the distribution of the national income, which in 1958 has increased fifteenfold per capita as compared with 1913. In the Soviet Union the entire national income belongs to the people. It is distributed as follows: for the satisfaction of personal material and cultural requirements of the people about 75 per cent is allocated, the rest, which is no less the people's property, is earmarked for expanding socialist production and for other social needs

The Soviet citizen, working in a factory or in the fields, in transport or in some scientific research institute—what you will—is not working for a private owner who battens on his labour, but for the whole people, in other words, ultimately for himself. When he is working and observing production discipline he is not subordinating himself to some stranger whose interests clash with his own, but to some other public servant like himself, though more qualified than he.

Every Soviet citizen is the master of his own land, enjoying equal rights with all other Soviet citizens. Politically, this fact finds expression in the system of Soviets.

In the same way that everyone in the Soviet Union is equal in work, so are they equal in their political rights. Each citizen has the right to vote and to be elected to the organs of state power—the Soviets of deputies of the working people, whether they be local Soviets or the Supreme Soviet of the U.S.S.R. Elections are held on the basis of universal, equal and direct voting rights with a secret ballot. The right to elect and to be elected

is not restricted by any property, race, or sex qualifications—everyone is entitled to vote or to stand for election, provided he has reached a certain age. Not money or estate or birth determines one's social status, but honest toil, personal ability, personal energy at work.

The air of equality which people in the Soviet Union breathe has enabled two thorny problems of the past to be solved—the women's problem and the national problem. Both of them have been solved and no longer exist.

Women enjoy equal rights with men in all spheres of economic, state, cultural and social-political life. Work done by women is paid for at the same rate as work done by men. Women can occupy all posts and positions that men can hold.

In the same way—on the principle of equality—the national question has been solved. All the nationalities that constitute the U S S R. are completely and in all respects equal.

Any direct or indirect restrictions of rights, or, on the other hand, the enjoyment of any direct or indirect advantage by citizen in connection with his racial or national affiliations, just as any spreading of ideas of racial or national exclusivity or hatred and prejudice are punishable under the law.

With the aim of guaranteeing to its citizens freedom of conscience, the church has been separated from the state in the Soviet Union. Everyone can believe as his conscience dictates, or, if he prefers, can be an unbeliever.

This then is the social structure of the U.S.S.R.

A society where all members work and receive according to the quantity and quality of that work has been established in the Soviet Union. "From each according to his ability, to each according to his work"—that is the principle of socialism.

Socialism, according to Marxist-Leninist theory, is the first stage of communism. Having built socialism, the Soviet Union has set itself the task of proceeding to the second stage—that of complete communism. Under communism consumer goods will be distributed among the people not according to their quantity of work, as now,

but according to their needs "From each according to his ability, to each according to his needs"—that is the principle of communism

Naturally, to bring into existence a communist society with its abundance of benefits a very high level of production has to be achieved. When, in 1917, Soviet power proved victorious in Russia and the task of achieving a communist society was first posed, the land was far—fifty, a hundred years—behind the more developed capitalist lands and it was necessary to make up for lost time in the shortest possible spell and to catch these lands up not only in the general volume of production but also in per capita production. Years of unprecedented toil passed, of toil in which the whole people participated—and the land reached a level of production when the outstripping of the most advanced capitalist lands became a practical and current task. The gap between the U.S.S.R. and the richest capitalist land—the United States—was reduced to a matter of a decade or so.

By 1959 the volume of industrial production in the Soviet Union was roughly half that of the United States, and the volume of agricultural production was about 20 to 25 per cent less than that of the United States; turning to per capita industrial production we find that the United States enjoys a 150 per cent lead over the Soviet Union, while in per capita agricultural production America's lead is about 40 per cent. On the other hand the rate of increase in production is substantially greater in the Soviet Union. The mean annual rate of growth in industry in the Soviet Union during its whole period of existence is from three to five times faster than the rate of growth of industry in developed capitalist lands.

Proceeding from the respective rates of increase of the national economy and the population in the U.S.S.R. and the U.S.A., we may assume that some five years after the completion of the Seven-Year Plan, and maybe earlier, the U.S.S.R. will lead the world in absolute volume of production as well as in per capita production, and this will provide its people with the highest living standard in the world.



Amateur performers, workers of the
Magnitogorsk Metal Works



A sanatorium at Gagra, Georgia

At the same time the people of the Soviet Union will have acquired a more highly developed communist consciousness and their inner desire to work for the good of society will have grown still more

The time is not far off when the Soviet Union will outstrip the United States of America and take the first place in the world in economic might But, naturally, this is far from meaning that the Soviet Union will have reached the target in its economic progress American standards are, of course, not the limit Communist abundance is unlimited, the flourishing of the people's forces has no frontier.

Men and women of a communist society will never halt on their creative, peaceful, inspiring advance to ever-higher peaks of human happiness.

To the Reader

The Foreign Languages Publishing House would be glad to have your opinion regarding this book, its translation, design and printing, and to receive any suggestions from you

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